

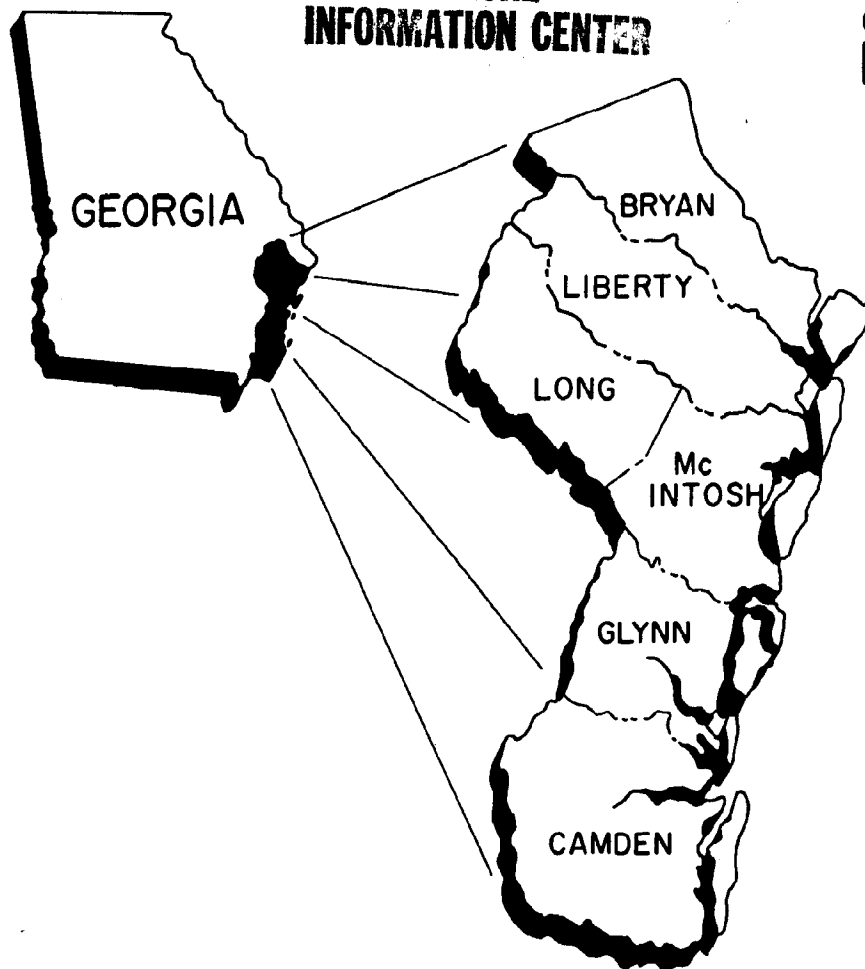
Coastal Zone  
Information  
Center

FEB 3 1975

# COASTAL GEORGIA

COASTAL ZONE  
INFORMATION CENTER

RESOURCE  
CONSERVATION  
&  
DEVELOPMENT  
PROJECT



GUIDELINES  
For  
DEVELOPMENT

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1973

ASSISTED BY  
U. S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE  
AND OTHER  
COOPERATING AGENCIES  
1973

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C O A S T A L      G E O R G I A

RESOURCE CONSERVATION AND DEVELOPMENT PROJECT

PROJECT PLAN

Prepared by the Coastal Georgia RC&D Project Sponsors

Bryan County Commissioners  
Camden County Commissioners  
Glynn County Commissioners  
Liberty County Commissioners  
Long County Commissioners  
McIntosh County Commissioners  
Coastal Area Planning and Development Commission  
Coastal Soil and Water Conservation District  
Satilla River Soil and Water Conservation District

U. S. DEPARTMENT OF COMMERCE NOAA  
COASTAL SERVICES CENTER  
2234 SOUTH HOBSON AVENUE  
CHARLESTON, SC 29405-2413

Assisted by  
U.S. Department of Agriculture and Other Cooperating Agencies  
Prepared under Authority of the Food and Agriculture Act of 1962  
(P.L. 87-703)

U. S. Department of Agriculture  
Soil Conservation Service  
Athens, Georgia

1973

1973

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MAR 1 1982



Executive Department

Atlanta 30334

February 15, 1974

Jimmy Carter  
GOVERNOR

Frank Moore  
EXECUTIVE SECRETARY

Mr. Charles M. Jones, Chairman  
Coastal Georgia RC&D Project  
Post Office Box 184  
Hinesville, Georgia 31313

Dear Mr. Jones:

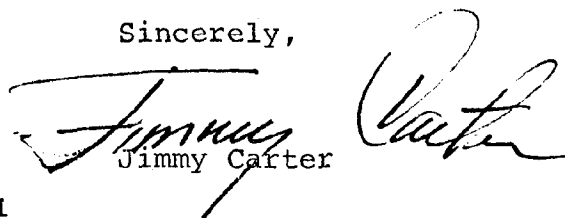
I wish to commend the diligent efforts and the forward looking leadership exhibited by the Executive Committee and the sponsors of the Coastal Georgia Resource Conservation and Development District. I have reviewed and am prepared to endorse your program as described in Guidelines for Development. The thoughtful assessment of problems and opportunities in the Coastal area, the establishment of worthy objectives and a workable plan of action represents the type of responsible planning needed to secure a continuing high quality of life for coastal Georgians.

It is my understanding that this endorsement enables the Secretary of Agriculture to approve planning assistance, in accordance with the Food and Agriculture Act of 1962, for further development of your program. I would like to go on record as urging the Secretary to approve such funding as soon as possible.

While the program includes many projects of obvious merit, the State reserves the right and anticipates the opportunity to review and comment on individual projects at the time of their funding application. A genuine offer of cooperation is extended to the project sponsors in developing the best programs for the good of the citizens and the natural resources of Georgia's coast.

I personally regret any delays and misunderstandings during the review process. If I can be of assistance in the future processing of your application, please inform me.

Sincerely,

  
Jimmy Carter

JC:js

COASTAL GEORGIA  
*R*ESOURCE *C*ONSERVATION & *D*EVELOPMENT PROJECT

LIBERTY COUNTY COURTHOUSE • P. O. BOX 184 • HINESVILLE, GA. 31313 • AREA CODE 912 - 876-6485

FOREWORD

We have developed and prepared at the request of our sponsors a program for the conservation and development of the many and varied resources of our area. In arriving at the program we have developed, we have received major assistance from county and city agencies, local groups, individuals, and Federal and State agencies, as well as the Coastal Area Planning and Development Commission. We are grateful to all who have participated for their valuable assistance, and wish to acknowledge that the plan we have developed could not have come into being without the help of those many participating groups and agencies.

We have discovered, in preparing our development plan, that there are many and varied problems, the most basic and pressing of which is an inadequate income due to unemployment and sub-marginal employment of major segments of our population. In most instances the income of a large segment of the area's population is inadequate to sustain a decent level of living. This situation has adversely affected, and unless corrected will continue to plague, the economic condition of the area's business operations. This quite naturally leads to limited job opportunities, requiring many of our most promising young people who constitute our most valuable resource to leave the area in order to seek employment elsewhere. If uncorrected, this condition will result in a definite lack of concerned and intelligent leadership in future years; therefore, one of our major goals is to develop our resources of all kinds in such manner as to improve and increase opportunities for our young people.

The program we propose hopefully will result in the intelligent and systematic development, utilization and conservation of our human, water, soil, plant, and recreational resources in order to bring about a much improved economic status for all persons in our area. It is our intention to implement the program by means of established priorities incorporated into annual work plans whereby specific projects are implemented, and in which financial arrangements and working agreements are established.

We realize that the development plan we have formulated is by no means an end to all ills, and that further and more extensive investigations will be imperative in ascertaining the feasibility of many of the project proposals. Therefore, we have hopefully formulated a plan which does not foreclose the possibility and probability of the addition of future proposals as they are identified; and we intend to implement additional project proposals upon their identification and isolation.

As stated, we have received much support from various individuals and governmental agencies in preparing the plan. But the plan itself will mean very little, if anything, unless positive action is taken toward the accomplishment of the objectives stated. If the past can be any guide to the future, we believe that we are able to anticipate the unselfish and diligent efforts of all these groups and agencies in assisting in the future with the implementation of the plan.



Charles M. Jones, Chairman  
Executive Board



## ACKNOWLEDGEMENTS

The sponsors of the Coastal Georgia Resource Conservation and Development Project gratefully acknowledge the assistance received in preparing this Guidelines For Development. The cooperation and assistance provided by representatives of the local organizations and agencies listed below have been particularly helpful.

We anticipate the continued assistance and support of these and other groups during the course of project operations. Our combined efforts will be essential to achieve the improvements which will meet the needs and earn the gratitude of the people of Coastal Georgia.

Local: Area News Media  
Brunswick-Golden Isles Chamber of Commerce  
Brunswick Ports Authority  
Brunswick Pulp and Paper Company  
Brunswick Recreation Advisory Board  
Coastal Area Planning and Development Commission  
Coastal Georgia Audubon Society  
Coastal Utilities, Incorporated  
Continental Can Company  
County Steering Committees  
County Technical Advisory Committees  
Glynn-Brunswick Planning Commission  
Glynn County Recreation Board  
Glynn Farms Company  
I.T.T. Rayonier Company  
International Paper Company  
St. Mary's Kraft Pulp and Paper Company  
St. Regis Pulp and Paper Company  
Thiokol Chemical Company  
Union Camp Corporation

State: Department of Education  
Department of Natural Resources  
    Division of Earth and Water  
    Division of Game and Fish  
    Division of State Parks  
Department of Transportation  
Georgia Forestry Commission  
Soil and Water Conservation Committee  
University of Georgia  
    Cooperative Extension Service  
    Division of Research  
    Marine Institute

Federal: Department of Agriculture  
    Agricultural Stabilization and Conservation Service  
    Farmers Home Administration  
    Forest Service  
    Soil Conservation Service  
Department of Commerce  
    Bureau of the Census  
    National Marine Fisheries Service  
    National Weather Service  
Department of Defense  
    Corps of Engineers  
    Fort Stewart Army Garrison  
Department of the Interior  
    Bureau of Sport Fisheries and Wildlife  
    National Park Service

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**Section I**

**COASTAL GEORGIA  
RC&D PROJECT**

## SUMMARY

Introduction--"Come over here; I have found a paradise." These are the words James Oglethorpe used in 1733 to describe Georgia to the English House of Commons. Indeed, it is still a land of great promise--many of the 97,000 inhabitants of Coastal Georgia would agree with his words even today.

But Coastal Georgia is also a land of great contrasts. Some of its people have high incomes; others have very low incomes. Some of its greatest resources go virtually untouched by human activity; others are destroyed by abuse. Water is one of the greater resources; it is also perhaps the greatest limitation to normal utilization of other resources. Some areas have superb scenery; other areas have become trash piles of community neglect. The ocean is at the very door of the entire population; the public has only limited access to it. A century and a half ago one of the more advanced agricultures in the country existed here; today agriculture is of relatively minor economic importance. The list could go on and on.

Summary of Project Organization--Many informed local leaders predict that a great demand will be made upon Coastal Georgia's natural resources as the region develops in the decades ahead. Perhaps the greatest opportunity of these years will be for local people to engage in the planning process for orderly development of area resources. The RC&D concept--that local people utilizing state and federal assistance can achieve this goal of creating a better environment for living by resource conservation and development--appealed to the progressive leaders in Bryan, Camden, Glynn, Liberty, Long, and McIntosh Counties.

The Coastal and the Satilla River Soil and Water Conservation Districts joined the Coastal Area Planning and Development Commission and the commissioners of the six counties in filing an application for planning assistance in January, 1971. The Coastal Georgia Resource Conservation and Development Project was authorized for planning by the Secretary of Agriculture in November, 1971, with the agencies filing the application becoming the legal sponsors.

Steering committees, representing a broad range of resource interests, were appointed in each county by the sponsors. The steering committees, utilizing a number of advisory committees, have responsibility for presenting the RC&D measure proposals made by the people in each county to the executive board and providing leadership for accomplishing approved measures.

The steering committees selected representatives for the RC&D executive board which has major responsibility for establishing the objectives, policies, and priorities for the sponsors. The executive board requested and obtained commitments of full participation from a number of technical agencies and other groups having mutual interest in developing and executing the project plan.

The primary objective of the project sponsors is to develop and conserve the natural resources of the area in a manner which will improve area living conditions. Population growth or economic expansion which diminish the quality of the environment will be considered undesirable. All project actions will be measured by this standard.



*The Coastal and Satilla River Conservation Districts include all counties in the project area.*



*Oak, pine, and palms abound on large areas of flatland and off-shore islands.*

Summary of Area Setting--Coastal Georgia has had a long history, recording major thrusts of European colonization since the 16th century by a succession of Spanish, French, and English colonists. Several decisive events have occurred within the project area which determined the eventual course of American history.

The Coastal Georgia Resource Conservation and Development Project is located in the southeastern corner of Georgia and consists of Camden, Glynn, McIntosh, Liberty, and Bryan Counties, which lie along the Atlantic Ocean, plus Long County which is situated one tier inland. The project area embraces an area of 1,941,100 acres of which 73.4 percent is non-tidal land area, 19.0 percent is tidal land area, and 7.6 percent is water area. The non-tidal land area is utilized primarily as commercial forest, agricultural land, and for urban or public uses.

Five major rivers enter the Atlantic in the project area and exert a major influence on economic development, land transportation routes, and land and water relationships.

The climate is warm and temperate to sub-tropical; the major factor of influence is proximity to the Atlantic Ocean. Average maximum temperatures range from about 63 degrees during winter months to about 91 degrees during the summer. Annual rainfall averages about 52 inches, with most frequent rainfall occurring between June and September.

The 1970 population of the project area was 97,087 -- 52 percent of which resided in Glynn County. Only Long County has failed to record population increases in recent decades. Continued increases in population are projected for the project area. The socio-economic problems of the people can be summarized as being unemployment, underemployment, low educational achievement, family instability, and low family income.

Two distinct economies function in the area. The first is located along the coast and is based largely on commercial and industrial activity. The second is located inland and is primarily based on the production of forest products. The overall economy has been steadily changing from agriculture to industry, with corresponding shifts in population and land use. The contribution of agriculture to the total economy has declined to the point that only timber production is of great significance.

Summary of Resource Characteristics -- The area is very young geologically; this immaturity is a dominant fact in topographic features and soils formation. Soils are deposits of marine origin, and about 92 percent of the project area is comprised of soils which have problems related to seasonal high water tables.

A majority of the inland landscape is characterized by a repeating pattern of relic beaches and abandoned islands separated by broad, level flatwood plains. The terrace-like topography and other natural characteristics result in frequent flooding and excess surface water problems.

The presence of this excess surface water is the dominant resource problem reflected in severe limitations on land use and the degrading of agriculture, forestry, community health, and general living conditions.

The area is blessed with significant human, forest, marine, wildlife, recreation, scenic, historic, water, and business resources. None of these resources has been developed to full potential, and the area is in fact quite underdeveloped in many respects.

The physical location, accessibility, and natural resources conducive to recreational activities create an excellent opportunity for Coastal Georgia to develop as a playground for resident and visitor alike.

The principal artesian aquifer has traditionally supplied all water requirements, and ample surface water is available for all foreseeable needs if it becomes necessary to restrict ground water pumpage. The complete development of the project area's water resources is a major key to future growth and economic development.

Coastal Georgia resources provide adequate living standards for many of the residents. For others, the quality of living leaves much to be desired in terms of employment, income, housing, public facilities, recreation, and other amenities of modern civilization.

Population and economic projections point to rapid development of several of the area resources and a corresponding responsibility of the local people to determine the course of this development in order to protect the quality of living. The completion of Interstates 16 and 95 is expected to have a significant impact on land use and economic development.



*Shrimp boats dock at Darien.*

Summary of Project Operations--A fundamental principle of RC&D is that community living standards can be improved if local leadership is committed to common objectives of resource management. The RC&D project is one instrument for defining and implementing these objectives, while retaining for local people the responsibility for making decisions and providing leadership.

Because landowners--farmers, industrial managers, developers, foresters, businessmen--have primary responsibility for resource conservation and development decisions, a major thrust of RC&D operations will be directed toward accelerating technical and financial assistance to this group. Perhaps the greatest opportunity for achieving the sponsors' objectives lies in influencing private decisions which will result in more effective resource utilization for the mutual benefit of owner and general public.

Another primary mission of project operations will be to secure the technical and financial assistance needed by local governments to develop natural resources for public use and to solve resource problems which require community action. The collective decisions of private landowners and local governments will largely determine the future conditions of Coastal Georgia's natural resources and influence the welfare of the area residents.

Other RC&D objectives can be accomplished only by the continued success of many public agencies and private groups presently engaged in activities which relate to resource management. Project operations will be coordinated with these programs to provide assistance, achieve mutual support, and avoid duplication of effort.

The success of economic and community development agencies, not directly involved in

natural resource development, is also essential for improving living standards in Coastal Georgia. Project operations will support the efforts of other organizations engaged in activities which achieve RC&D sponsors' objectives.

The local RC&D leadership has established high priorities on forestry, recreation and wildlife development, solid waste disposal, water management, land use planning, and agricultural problems. RC&D measures which address these problems have been adopted by the sponsors for the initial stages of project operations. Future priorities and courses of action will be established by the RC&D executive board in preparing annual plans of work based on county RC&D steering committee priorities.

Benefits from completed RC&D measures are expected to accrue primarily in the form of improved conditions for area residents; but secondary benefits may be expected to result in accelerated expansion of the local economy as resources are utilized, new enterprises developed, and new jobs created.

Additional planning will be necessary during the course of project operations, to reflect changing conditions in keeping with the "open-ended" concept of RC&D. Additional RC&D measure proposals will be considered by the county steering committees during the period of project operations.

The local RC&D leadership realizes that all of the problems of Coastal Georgia may not yield--even to combined efforts of all its people working together through local governments and the assisting agencies. These leaders are confident, however, that natural resource conservation and development will conquer many of these problems and prevent others from occurring.



*RC&D executive board members plan for the future.*





## Section II

# **A LOOK AT COASTAL GEORGIA**

## PHYSICAL SETTING

Location--The Coastal Georgia Resource Conservation and Development Project is located in the southeastern corner of the State of Georgia. It lies roughly midway between Jacksonville, Florida, and Savannah, Georgia. Brunswick, the largest city in the project area, is 83 miles south of Savannah and 78 miles north of Jacksonville.

The project area extends from the St. Mary's River at the Florida line on the south to the Ogeechee River on the north. Camden, Glynn, McIntosh, Liberty, and Bryan Counties border the Atlantic Ocean which forms about 85 miles of the eastern boundary. Long County is located one tier inland, but the geographic characteristics are similar to those of the inland sections of the other counties. Connecting county lines form the western project area boundary.

Planning Agencies--All six counties are contained within the boundaries of the Coastal Area Planning and Development Commission. McIntosh, Liberty, Long, and Bryan Counties are members of the five-county Coastal Soil and Water Conservation District. Glynn and Camden Counties are members of the eight-county Satilla River Soil and Water Conservation District.

Size--The Coastal Georgia Resource Conservation and Development Project is approximately 110 miles long and varies in width from about 25 to 50 miles. The six-county area contains approximately 1,941,100 acres or 3,033 square miles, which amount to approximately 5.2 percent of the total area of the state.

Landscape--The Atlantic Ocean side consists of a broken chain of barrier islands separated from the mainland by a wide expanse of saltwater marshes, estuaries, and tidal streams. The mainland coast fronts on this unique pristine tidal system, affording scenic vistas from the short, steep bluffs which ascend by well-defined steps to higher elevations inland. On these coastal bluffs are located a number of fishing villages, shrimper's docks, historical sites, and recreation facilities which create a delightful setting for residents and visitors alike.

The interior is characterized by flat, poorly drained land known regionally as the Atlantic Coast Flatwoods. With the single exception of the extreme northwestern section, the elevation of the project area is very low, approximately 80 percent being less than 30 feet above sea level. Geologically, the Georgia coast is immature to the extent that few natural drainage channels have become established which are capable of providing even slight relief for normal water movement through the inland areas. The entire project area is located within the Coastal Plain Land Resource Region (L.A.R. No. 153).

In addition to the major rivers which form both north and south boundaries, the area is transversed by the Satilla, Canoochee, and Altamaha Rivers, plus numerous smaller local streams which flow in an easterly direction into the coastal estuaries.

Table 1

<u>County</u>	<u>Surface Area</u>	<u>Non-Tidal Land Area</u>	<u>Tidal Land Area</u>	<u>Water Area</u>
Bryan	291,200	86.6%	9.0%	4.4%
Camden	444,800	65.6%	27.2%	7.2%
Glynn	297,600	59.3%	28.0%	12.7%
Liberty	343,000	81.8%	12.4%	5.7%
Long	257,900	99.5%	---	0.5%
McIntosh	306,600	54.4%	31.7%	13.9%
Project	1,941,100	73.4%	19.1%	7.5%

## SOCIAL SETTING



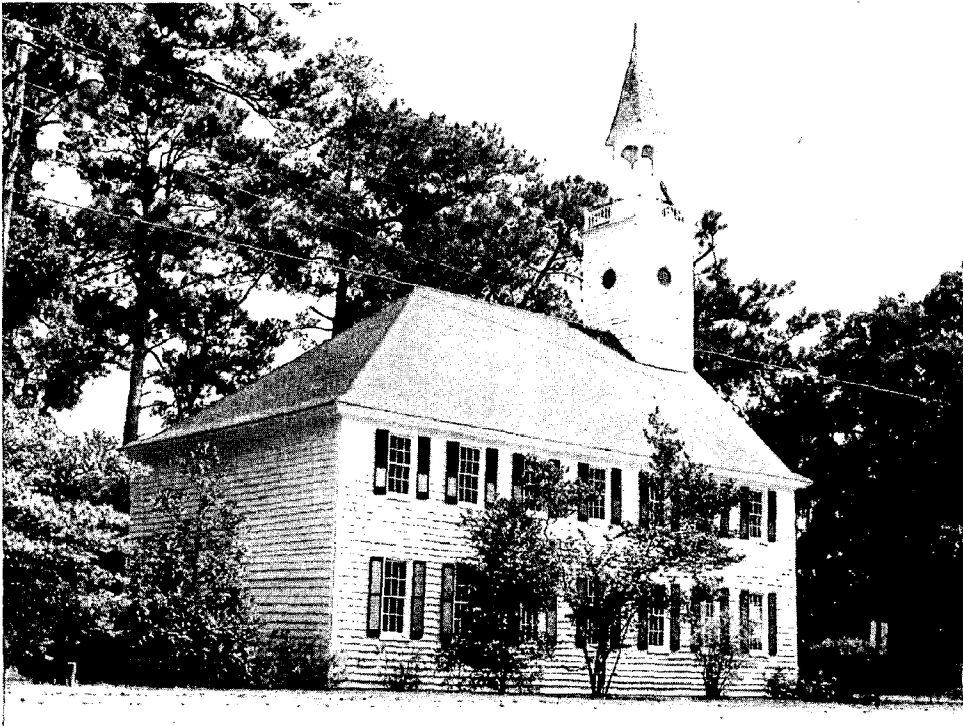
*Midway Cemetery--A link with the past.*

Coastal Georgia has been the location of many decisive events in the course of American history.

Early History--The Georgia coast has been occupied by man for at least 10,000 years, and identifiable traces of occupation which date back to 2000 B.C. are plentiful. Well established Indian tribes were the first settlers. The first known white settlement was located on St. Catherine's Island and was established about 1566.

During the second half of the 16th century, the area was a part of a Spanish district known as Guale, named for the most powerful of the Indian tribes. Conflict with the English gradually forced the Spaniards back, and the missions were abandoned in 1686; but final claims were not relinquished by the Spanish until the Battle of Bloody Marsh on St. Simons Island in 1742.

The French made limited attempts to claim Coastal Georgia; then the English became fully committed to colonizing the area in 1736 when James Oglethorpe established a settlement at Frederica and built Fort Frederica as protection against the Spanish for the other colonies further north. After 1750, the English population and influence grew and gradually prevailed over the remaining French and the Indians.



*Many influential Americans have worshipped at historic Midway Church.*

Population--The population is a blend of pioneer stock families and newcomers to the area. Industrial development, military assignment, and an influx of retirees are major factors influencing in-migration during this century. Only 3.1 percent of the total population is classified as being rural farm, indicating a lower rural farm density than the remainder of the state. The increase in the white population was greater than the non-white population during the previous decade.

Problems--The social-related problems of the people of Coastal Georgia can be summarized as being unemployment, underemployment, low educational achievement, family instability, and low family incomes. Each of these problems is interrelated and can be either causes or effects of the others.

Housing--Housing characteristics are determined by fiscal, economic, and social conditions which are also interrelated and are an integral part of the total living conditions of each community. Outside the city of Brunswick, in which about one-fourth of the total population resides, housing is concentrated in towns and small communities scattered along the major highways. Large blocks of land in the interior are virtually uninhabited.

Due to low cost and easy accessibility, mobile homes have become popular as temporary housing, accounting for 8.3 percent of the 1970 total housing supply. In 1970, the project area had nearly 2,000 surplus housing units which were not occupied because of location, cost, or physical obsolescence and lack of conveniences. Fifty-three percent of all housing units were considered either structurally obsolete or inadequate at the time.

Education Levels--Educational achievement in the project area is below state and national averages. The low level of basic education constitutes perhaps the greatest problem confronting efforts to accelerate economic development. Unfortunately, children of parents with low educational achievement tend to receive little education themselves, completing the vicious cycle common to other social problems.

Job Opportunity--A major deterrent to economic development is the lack of a trained labor force. Another related problem is the apathy of many unemployed and underemployed persons toward the possibility for individual development. Successful training programs must improve the attitude as well as the skills of these potential employees.



One change in land use is new housing outside metropolitan areas.

## ECONOMIC SETTING

Agricultural and forestry products generated most of the economic activity in Coastal Georgia prior to World War II. Recent economic development has been characterized by a trend away from marginal farming operations to ever-increasing production of forest products and to commercial or industrial development.

Two Economies--The project area can be conveniently divided into two sections which exhibit distinct differences in both sources of income and general level of economic activity. The first is based along the Atlantic coast and is supported by diversified development consisting of tourist services, real estate, seafood processing, transportation, recreation services, manufacturing, government services, trade, and service industries. Advances in these enterprises have very fortunately provided employment for many of those displaced from agricultural and forestry jobs throughout the area.

The second section is located along the interior flatwoods section and is dependent primarily on a small agricultural base, operations of Fort Stewart Military Reservation, and production of forestry products. The large landowners of plantation days have been replaced by even larger timber corporations which have purchased extensive acreages of wood-producing land to supply a portion of the raw materials needed for their manufacturing operations.

Regional Influence--The sectional economy of Coastal Georgia has a mutual reliance upon outlying communities and regional commercial centers for employment, markets, raw materials, services, and other components of modern commerce. Savannah is the major economic center in southeast Georgia, Jacksonville being the corresponding center of northeast Florida. Both cities exert considerable influence upon the local economy of Coastal Georgia.

Economic Problems--Major economic and social problems exist in both economic sectors but are more readily recognized in the interior flatwoods section. Agricultural income and employment have not kept pace with the general economy. Military expenditures fluctuate with national fiscal and defense policy. Timber related activities employ a large and important segment of the work force, but worker per acre ratio is extremely low and becomes lower as more sophisticated machinery is developed for producing and harvesting woodcrops.

Due in part to the absence of an extensive agricultural economic base, the total area economy has not changed as drastically in the last 25 years as those in other regions of the state. A substantial commercial and industrial base has developed in the Glynn County area and in several smaller communities. Many segments of the population have good jobs and profitable businesses. However, both per capita income and median family income are below state and national levels; 23.8 percent of project area families had an income of less than \$4,000 in 1970.

Economic Potential--Considerable growth has occurred, and continuing growth is projected in the economic sector located along the coast. A more concerted effort will be required in order to realize significant progress in solving the economic problems of the interior.

With the completion of Interstate 95, the area should experience an expansion of tourist service business and perhaps some acceleration of light industrial development within a 10-to 25-mile radius of interchanges along the new highway.

The availability of water transport facilities is an important major resource influencing the location of new industrial investment in the project area.

The Coastal Area Planning and Development Commission, cooperating with several local industrial development groups, is engaged in efforts to expand enterprises which would increase employment and business activity.

## CLIMATIC SETTING

The moderate climate of the Georgia coast is one of the great intangible resources of the area. The climate is warm and temperate to subtropical, the major factor of influence being the proximity to the Atlantic Ocean. Considerable variation is experienced within the project area as the distance from the coast increases. The relative humidity is usually quite high. Early morning averages range between 83 and 93 percent, decreasing by early afternoon to between 48 and 63 percent. Average wind speeds vary from around seven miles per hour in mid-summer to almost ten miles per hour in early spring. The prevailing direction is northeasterly during the colder months and southwesterly during the warm season.



*Climate produces lush vegetation and encourages widespread study and enjoyment of the area's natural resources.*

Rainfall--The annual rainfall in the area ranges between 49 and 54 inches, with the larger averages just inland from the coast. The season of greatest rainfall is summer to early autumn, with most of the area receiving half the annual total from June through September. November, with an average of just under two inches, is the driest month. The average number of days with rainfall of one-tenth inch or more varies from ten in July to four in November. The average for the year is 75 to 80 days with significant rainfall.

Temperature--Average maximum temperatures range from about 63 degrees during winter months to about 91 degrees in July and August. The temperature exceeds 90 degrees on 75 to 80 days, and freezing occurs on 12 to 25 days, with the smaller numbers being along the immediate coast. The average length of the freeze-free season decreases from almost 300 days along the coast to 250 days in the higher elevations of Bryan, Liberty, and Long Counties.

Severe Weather--Tropical disturbances are responsible for most of the heavy rainfall. Major storms affect the area on an average of once each year, but storms of hurricane intensity occur less than one year in ten. Tornadoes occur less frequently than in the more inland areas of the state. Thunderstorms occur on 60 to 75 days during an average year. Snowfall accumulations are extremely rare in Coastal Georgia.

## Section III

# **RESOURCES OF COASTAL GEORGIA**

## PEOPLE

Between 1950 and 1970, the total population of Coastal Georgia increased nearly 61 percent, from 60,383 to 97,087. Camden, Glynn, and Liberty Counties recorded significant population gains during this period while Bryan, Long, and McIntosh Counties increased very little. Glynn County and the Brunswick urban center have consistently accounted for the greatest portion of the area population.

Table 2

### POPULATION DATA 1970

County	Total Population	Percent Change 1960-70
Bryan	6,539	+5
Camden	11,334	+13.6
Glynn	50,528	+20.4
Liberty	17,569	+21.3
Long	3,746	-3.3
McIntosh	7,371	+15.8
Project	97,087	+17.2

According to projections by the Coastal Area Planning and Development Commission, the area's population growth is expected to continue, but at a slightly lower rate during the next two decades. A significant influx of seasonal and permanent residents into Bryan County from Savannah and into Camden County from Jacksonville is anticipated during this period.

Population Characteristics--Age distribution varies greatly throughout the project area. Forty percent of the total population falls within the dependent age group (1 to 18 years), and eight percent of the population is 65 years of age or older. More complete data on population characteristics are presented in the appendix.

Education--Of all persons over 25 years of age, 18.6 percent have fewer than 4 years of formal education, 70.3 percent have 5 to 12 years, and only 10.9 percent have 13 years or more. Employment opportunity is directly related to education and training--a fact which becomes more important each year as the area moves further away from a simple agricultural economy. There is a good demand for trained and experienced employees in a variety of skilled occupations even at a time when total unemployment is high.



*Working in their outdoor classroom, students at Ludowici learn about mankind's responsibility for natural resource conservation.*

Employment--Total employment in the region, particularly in manufacturing employment, has increased significantly in recent years. Manufacturing and processing industries provide the largest number of jobs in Camden, Glynn, and McIntosh Counties. Due to civilian employment at Fort Stewart Military Installation, state and federal government are the primary employers in Bryan, Liberty, and Long Counties.

The labor force has become quite mobile, many workers traveling distances of up to 65 miles daily to reach their jobs. Many residents travel outside the project area to places of employment, meeting other workers who travel similar distances to jobs within the project area.

Table 3

### AVERAGE WORK FORCE ESTIMATES 1972

County	Civilian Work Force	Average No. Employed	Employed Agriculture	Unemployment Rate
Bryan	1,490	1,370	80	8.1
Camden	4,290	4,100	80	4.4
Glynn	22,080	21,530	120	2.5
Liberty	4,610	4,360	80	5.4
Long	640	550	80	14.1
McIntosh	1,870	1,800	20	3.7

Georgia Department of Labor



Income--By 1970 the area's median family income had increased to \$7,318, but was still below the state average of \$8,167 and far below the national average of \$9,590. Camden and Glynn Counties record the highest income levels in the area while Long County families earn the lowest apparent income. Of Coastal Georgia families, 8.9 percent received public assistance in 1972, and 11.0 percent received commodity foods or food stamps.

Table 4

County	Median Family Income	Per Capita Income	No. Public Assistance Recipients
Bryan	6,490	1,891	449
Camden	8,390	2,228	564
Glynn	7,958	2,566	1,614
Liberty	6,063	2,010	862
Long	5,414	1,630	358
McIntosh	5,630	1,729	436

Sources: Bureau of the Census 1970  
Georgia Department of Family  
and Children Services  
(October 1971)

People and Local Government--The role of local government in Georgia has changed dramatically in recent years as population has increased and demands for public services have accelerated. The county commissions have become the focal point for initiating problem solving programs. Local government bodies for health services, education, recreation, resource conservation projects, industrial development, community planning, and water and sewer systems are but a few examples of public or quasi-public agencies which succeed or fail to the extent that county government responds to the needs of constituents.

Cities are subject to similar demands for services; but increasingly, city and county governments are joining forces to create more efficient facilities and services. Further

increases in both city-county and county-county cooperation will be needed as local governments having small taxbases attempt to provide these services in the future.

Projected increases in permanent and seasonal populations can be expected to result in similar increases in demand for building sites, water supplies, and other governmental services. High population densities make problems of land use more difficult to resolve and of greater importance to more people. Excluding Glynn County, the population density of the project area averages 19.1 people per square mile, which would appear to be very low when compared with similar areas elsewhere. However, the pattern of housing development is not well dispersed, and the population density of residential areas is actually quite high.

A more detailed discussion of the important role of local government is contained in the Community Facility and Service Section and is referred to briefly in other resource sections of this document.

Project Opportunities--One of the important objectives of the project sponsors is to assist local governments to guide future development which will conserve the coastal environment and insure good living conditions for the people of Coastal Georgia. Local people have an opportunity to participate in the decision-making process.

Collectively the people of Coastal Georgia have an opportunity through their local units of government to join efforts in seeking solutions to problems which can best be solved on a county-wide or multi-county basis.

The people in each community have an opportunity through personal and group efforts to improve their communities by maintaining attractive surroundings and investing the required funds in improving community services and facilities.

## LAND

Characteristics of the land resource have been the pivotal factor in determining the ultimate course of Coastal Georgia development. Land utilization patterns have been determined by the nature and location of land and the relationship of land to economic and social needs of the people.

Extensive agricultural operations developed two hundred years ago along the immediate coast; but because of land-related limitations, settlement did not spread inland into the flatwoods section of the project area for many decades. For example, mosquito populations have always thrived due to the large area of wet land; and until well into the 19th century, few men would willingly spend a night in the mainland interior for fear of developing "Swamp Fever."

The land resource may be conveniently classified into three categories: off-shore barrier islands, marshlands, and the mainland.

Off-shore Barrier Islands--The Golden Isles of Georgia have never made a great contribution to the mainland economy. During the decades when occupied by the great agricultural plantations, they were self-contained communities, manufacturing nearly everything needed on the plantation from shoes and cloth to furniture and tools. During much of this century, sev-

eral of the islands have been used primarily as private retreats and wildlife preserves, with only limited commercial timber and livestock operations contributing significantly to the mainland economy.

Few stands of virgin timber remain, but near-wilderness conditions exist on some islands as a result of special management provided by recent owners. There are instances, however, where overpopulation of certain wildlife species or overgrazing by domestic animals have resulted in deterioration of vegetative cover and subsequent wind erosion problems.

The 1972 land use and ownership status of the major islands: St. Catherine's Island is an inaccessible pastoral property in one private ownership; Sapelo Island, also inaccessible, is in partial administration as a State Wildlife Refuge and University of Georgia Marine Research Center; Blackbeard and Wolf Islands are both inaccessible National Wildlife Refuges; St. Simons Island is partially developed as a restricted, unincorporated resort and residential community; Little St. Simons is an inaccessible private wildlife sanctuary; Jekyll Island is a state park having a significant commercial and residential development; and Cumberland Island is being established as a National Seashore, accessible only by water transport.

The islands represent only 4.0 percent of the total project land area but constitute an enormous resource potential for recreation, tourism, residential, wildlife, nature study, or other uses. Recently, the use and protection of the off-shore barrier islands have become matters of both state-wide and regional interest.

Marshlands--The area between the barrier islands and the mainland coast is occupied by tidal marsh and related watercourses. These marshlands provide the habitat and supply the food for a wide variety of plant and animal life in addition to other natural functions.

The esturine system is very important from both economic and ecological considerations, making the marshland resource of concern to the general public. Consequently, land use regulations have been implemented to provide adequate protection for this fragile landscape.

Mainland--The mainland land resource consists of scattered chains of relic barrier islands separated by wide flatwood plains. The abandoned island formations of previous sea levels comprise virtually the entire land resource having adequate natural drainage; and they are, therefore, the preferred locations for all intensive land uses.

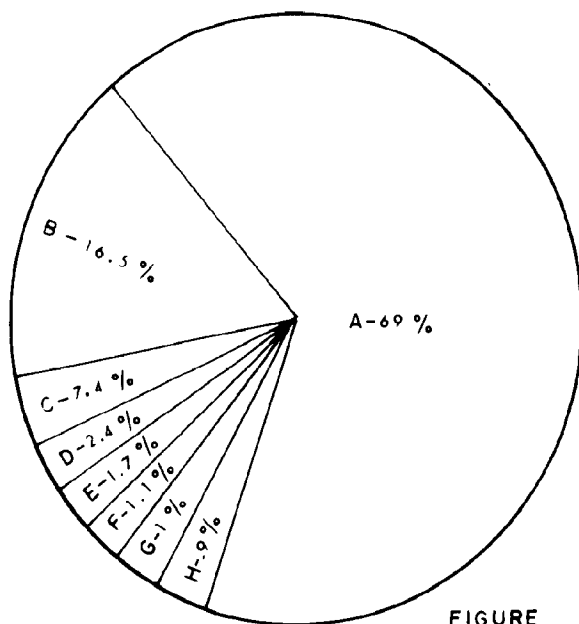
A vast majority of the mainland area consists of the flatwood plains, generally having natural flooding problems and high seasonal water tables which present serious limitations for almost all land uses.

About 455,000 acres of mainland are occupied by tidal swamps, river flood plains, basins, and flats which generally have moderate to high values as wildlife wetland as a primary or secondary land use.

Land Use Distribution--Streams, ponds, sounds, and other bodies of permanent water form an important feature of the landscape throughout the project area, covering approximately 145,000 acres, or 7.4 percent of the total surface area. The remaining 1,795,500 acres of project land area are utilized for a variety of uses, generally for multiple-purpose activities. The generalized land use map contained in this section attempts to identify the pattern of existing use.

Forest lands, including tidal swamps and farmer and publicly owned woodlands, occupy about 75.0 percent of the total project land area. Approximately 18.1 percent of the land area consists of salt and freshwater tidal marsh. Federal, state, and local governments

#### PROJECT SURFACE AREA DISTRIBUTION



- A - FOREST
- B - MARSH
- C - WATER
- D - URBAN
- E - CROPS
- F - OTHER
- G - PASTURE
- H - RURAL ROADS

FIGURE 1

have committed approximately 339,000 acres to public uses, amounting to about 18.8 percent of the project land area. State parks make up about 6,250 acres or 1.8 percent of this land. Approximately 10.8 percent of the total land is used for agricultural production, including intermingled farm woodlands.

The incorporated towns occupy about 48,000 acres or 2.7 percent of the land area. Since Coastal Georgia is predominantly rural, only about 4,000 acres or .22 percent is presently used for industrial and commercial purposes; but an additional 20,000 acres have been designated for this purpose. A major part of the land devoted to commercial uses is allied with the tourist trade which provides goods and services along the main highways. There are more than 1,900 miles of public roads and highways in the project area. These roads and their rights-of-way require more than 18,000 acres of land. Semi-public lands consist of church lots, community building grounds, and some industry-owned land devoted primarily to wildlife preservation. This category of land use constitutes 1.4 percent of the total land area.

Land Utilization--As an area with a 300-year history of settlement, Coastal Georgia quite naturally has a legacy of conditions common to communities evolving from a succession of unplanned developments. A substantial number of central city commercial buildings and residential structures are dilapidated and obsolete, as are the older community facilities. Throughout the project area, residential construction, industrial expansion, and other forms of land development have occurred without adequate comprehensive planning.

In future land development, primary concern should be the protection of those amenities such as scenic streams, coastal vistas, historic sites, fishing villages, and the natural beauty which make Coastal Georgia a delightful place to live. Reasonable land use regulations and construction standards should be adopted for adequate protection of the individual landowner and as essential guides for attractive and efficient communities.

Many beautiful waterfront lots having acceptable soil properties are located along the major rivers and coastal bluffs. Inland soils suitable for intensive uses occur along the prehistoric beaches and barrier islands; but unfortunately, island patterns do not always coincide with community patterns. Many fine homes have been constructed on these moderately well-drained soils when they occur at the desired locations; but land costs are usually high and will likely become higher as the supply diminishes.

Large areas of Coastal Georgia reflect little evidence of land development, perhaps suggesting to the casual observer that ample land is available for any proposed enterprise.



*Quality housing built on suitable soils and protected by watershed protection and flood prevention project.*

In fact, land suitable for any intensive use--residential construction, for example--is very limited and simply does not exist in many communities.

The extensive area having excess water problems limits the amount and location of land suitable for residential development throughout most of the mainland interior. Therefore, hundreds of homes--many of them expensive--have been constructed on poorly drained sites. Poor families particularly are seldom able to purchase the desirable building lots on the relic islands. People build on the flatwood plain sites having seasonal water problems which generally make them unsuited for private sewer systems and further contribute to poor living conditions and frequent health problems.

Similar land-related problems occur to some extent throughout the project area for agricultural, forestry, community facility, industrial, and other land uses. Adequate conservation planning is essential for proper utilization and treatment of the land resources.

The predominant soils are sandy and highly erodible, but soil erosion is seldom a severe problem except on constructed slopes and along unprotected stream banks.

Land Ownership--Land ownership patterns vary greatly within Coastal Georgia, ranging from communities having only single lot ownerships to sections having a few large ownerships. The question of marshland ownership has not been completely resolved. In addition to large holdings by the federal government, several corporations engaged in pulp and paper manufacturing have extensive investments in land holdings. All corporations combined own approximately 33 percent of the total project area. Approximately 39 percent of the commercial forest land is owned by forest industries, and the remainder is divided between miscellaneous private and public ownership, 43.3 percent and 17.6 percent respectively.

Project Opportunities--Inasmuch as land is the basic natural resource in the project area, proper land use becomes a primary objective of the project sponsors. The area has reached a point in its economic development which requires greater concern and more involvement by the general public and local governmental agencies in land use planning.

The executive board will encourage the county governments, as sponsors of the RC&D project, to exercise their opportunity of preparing county-wide land use plans based on the desires of the local people, and utilizing all of the technical expertise available from public agencies and private consultants. County governments will be encouraged to enact and enforce the necessary zoning and other regulatory measures needed to implement the land use plan.

The various resource agencies have an opportunity to provide the technical assistance needed by landowners to make decisions which will insure the proper utilization of the land resource. Since the effective management of land is a basic prerequisite for the economic development of the area, private landowners have an opportunity to contribute to area development by utilizing their individual land resources.

The soil and water conservation districts have an opportunity to request technical and financial assistance to accelerate land treatment, to eliminate critical conservation problems, to seek accelerated conservation planning assistance for private land users and to provide technical assistance for inventorying and monitoring land resources.

The RC&D executive board has an opportunity to seek accelerated research and experimental construction studies to obtain solutions for the serious and extensive bluff erosion problems along coastal streams. County steering committees can seek assistance through existing programs to solve more pressing bluff erosion problems.

## BRYAN CAMDEN GLYNN LIBERTY LONG AND McINTOSH COUNTIES GEORGIA

COASTAL GEORGIA  
RENO PROJECT

81° 4'

2.4A      2.31 685 2      10000      0.00 0.00

BASE COMPLETED FROM 19 5-MIN SCALE AND QUADRANT SHEET

52° 00' ————

51

320

**700 000**

700 000

LEGEND

100

—31\*30

400 000

400 000

41 0

---



519

F L O R I D A

**LEGEND**

(Generalized Map of Existing Land Use)

### Forest and Agriculture

**FIGURE 6**

Wood Industry Owned or Leased - Forest

### Conclusion

Industrial

Public Owned Lands – State

Public On

FEBRUARY 1973

REVISÉ JANUARY 1973

4-R-32,645

4-R-31,362

## WATER

Georgia comes down to the sea in the project area. The meeting is both uncertain and incomplete, making it difficult at times to distinguish between land and water. The presence of water influenced Coastal Georgia's formation, determined the nature of its people, influenced its history, and decided the course of its economic and resource development.

Historical Perspective--All early settlements were located adjacent to navigable streams, either on the coast or along the inland rivers. Only with improved methods of land transportation and construction of roads did European civilization spread into the hintermost regions of the project area.

Canals have been utilized for transportation and water management since the mainland coast was settled during the 18th century. Flood control structures have long been considered an essential basic public facility and accepted as a community responsibility. The earliest commercial agricultural operations were dependent upon the vast water supply and water management installations on the tidal flats. Few of the existing residential areas could have been utilized without provision for basic flood control and drainage.

Ground Water--All domestic water is derived from ground water, most of which is drawn from the principal artesian aquifer. An ample supply of high quality water is essential for many manufacturing processes and has been an important factor in the industrial development of the area. Ground water presently supplies approximately 155 million gallons of water per day for industrial uses, in addition to domestic pumpage. The ground water resource map shows the approximate depth to the aquifer and 1972 piezometric levels.



*Water control channel in Mill Creek Watershed (Bryan County) enables more effective management of land, forest, and wildlife resources.*

As domestic requirements increase and additional industrial demands materialize in the region, more ground water can be expected to be withdrawn from the principal artesian aquifer. Because of the vast quantity of ground water, some decline in the piezometric level resulting from increased pumpage would not prove an immediate hardship for water users in most sections of the project area. Continued increases in withdrawal rates will necessitate pumping in areas where artesian flow is no longer sufficient and the lowering of intakes on existing pumps.

However, water quality problems such as those now becoming apparent in the Brunswick area may very likely arise if sufficient pressure imbalance develops, allowing the entry of water of undesirable quality into freshwater zones. Salt water intrusion could become a problem of serious consequence, but future ground water withdrawal rates will be controlled by the Georgia Department of Natural Resources. Virtually unlimited supplies of usable surface water are available which are not presently being utilized, and new plants can be designed with more sophisticated water recycling systems in order to conserve water.

**Rain and Flat Land**--High average rainfall, combined with intensive rain patterns during early spring and the fall hurricane season, result in standing water on one-fourth to one-half of the project area during wet periods.

Flooding in Coastal Georgia does not follow the classic pattern of floods in regions having well-defined drainage systems. Most people have a mental image of a flood as a rapidly rising water elevation flowing several feet deep at a high velocity over a narrow valley floor for a relatively short period of time. Life is jeopardized and immediate property damage can be anticipated. This contrasts with coastal flooding which occurs slowly, standing not more than a few feet deep over a vast area, flowing very slowly if at all, and remaining in place for weeks following heavy rainfall. Immediate loss of life and property destruction seldom result, and consequently coastal flooding seldom makes headlines.

While perhaps less dramatic, the coastal flood is a great problem to the resident in terms of inconvenience, degradation of property values, and living conditions, as is the raging torrent to the inhabitant of the hill country.

**Water and the Flatwoods**--The topography of Coastal Georgia is basically a repeating pattern of sand ridges, each higher than the seaward plain below, but also slightly higher than the flatwood plain further inland. Except in locations adjacent to the streams which break this ridge, surface water has no direct outlet toward the sea.

Owing to the level topography and the other natural characteristics of the area, only tidal streams have sufficient velocity to develop well defined channels. The smaller tidewater streams are usually known locally as creeks while corresponding inland fresh water sections are known as swamp. Moving upstream, channels become smaller and poorly defined to the point that water courses having thousands of acres of drainage area have no identifiable channel. These water-courses flow at almost undetectable velocities over a broad breadth of near-level plain during periods of heavy rainfall, only to cease completely during dry seasons. Many of these flatwood plains are interconnected, water flowing one way at one season, and in the opposite direction at another time.



*Water floods thousands of acres of flat land following heavy rains.*





*Flooded homes in Brunswick.*

**River Water**--A casual examination of the drainage pattern of the state will reveal that Coastal Georgia forms the outlet of a giant watershed funnel through which the surface runoff of over one-third of the state flows. Five major river basins, having a total drainage area of approximately 24,500 square miles, flow into the ocean in the project area.

As the drainage basins approach the ocean, the hills which separated the watersheds further inland become mere ridges in the coastal flatwoods. Following periods of heavy rainfall and subsequent flooding along the upper reaches of these river basins, floodwaters finally reach the flat gradients of the lower coastal plain. During peak flood periods, water levels reach elevations above the natural floodplain divide, permitting floodwaters to flow overland into the adjacent watersheds. It is not uncommon for these floods to flow across thousands of acres of land on which very little rain has fallen during the rain period which produced the floodwater.

Infrequent instances of simultaneous high tides, heavy rainfall, and east winds result in severe flooding along the immediate coast. High tide waters enter the creek outlets producing reverse flows which impede drainage efficiency at the very time maximum flows are needed, contributing to further flooding upstream along the inland streams.

**Flooding and People**--Commercial and residential areas suffer the flooding problems common to their location--tidal, river, or flatwood flooding. Excess surface water is one of the

more common environmental health problems relating to both pollution contamination and high insect populations. The nature of flooding in the area makes meaningful delineation of natural flood zones very difficult or impossible in many locations.

**Economic Relationships**--The Savannah District of the Corps of Engineers has responsibility for providing navigation channels in Coastal Georgia waters. The Atlantic Intracoastal Waterway provides a protected coastal channel 12 feet deep and from 90 to 150 feet wide for commerce and small craft along the east side of the project area. Navigation channels varying in depth from 10 to 32 feet and 80 to 500 feet wide are provided in and around the city of Brunswick, and channels from 8 to 28 feet deep and 50 to 200 feet in width are provided in and around St. Marys. Additional channels of varying dimensions are maintained at Sapelo Harbor, Darien Harbor, and along lower reaches of the Altamaha River, Fancy Bluff Creek, Satilla River, St. Marys River, and North River. These Corps of Engineers projects contribute to the utilization of the water resource by providing connections to the intracoastal waterway and the ocean.

Water is essential for many major recreational activities and contributes significant enhancement features to many other forms of recreation as well as improving the quality of living in other ways.

Water has filled an important role in the history of the region and has the capability of making further economic contributions in the areas of recreation, tourism, fisheries, and transportation.

Local Action--The quality of living can be greatly upgraded through the development and management of the water resource. The opportunities and need for better soil and water management are just as great in the flat, waterlogged coastal plain communities as they are in regions having well-defined natural drainage systems.

The recurring water management problem of greatest concern to the local resident is adequate provision for excess surface water removal. Due to low relief, a single land owner is seldom able to obtain an adequate outlet, requiring group action. Many of the more pressing water management problems can be solved through cooperative local, state, and federal action utilizing existing programs.

Project Opportunities--One of the major objectives of the project sponsors is to maintain a safe and plentiful supply of water for municipal, industrial, agricultural, and recreational use through wise management, control, and utilization.

The local people, acting through watershed associations, county governments, and the RC&D executive board, have an opportunity to request accelerated technical and financial assistance from state and federal agencies as appropriate in order to develop and adequately manage the water resource.

The RC&D steering committees and executive board have an opportunity to request assistance of appropriate state and federal agencies to prepare and publish a stream classification and fishery inventory of streams in each county.

The navigation channels and port facilities afford opportunities for improvements which would directly enhance economic development potential. Assistance can be requested from the U. S. Army Corps of Engineers for needed improvements.

The few existing natural impoundment sites offer opportunities for development of private and public water-based recreation activities.

County land use planning presents an opportunity for local people to delineate identifiable natural flood zones and to control the types of development which will be permitted or to plan adequate programs for protection.



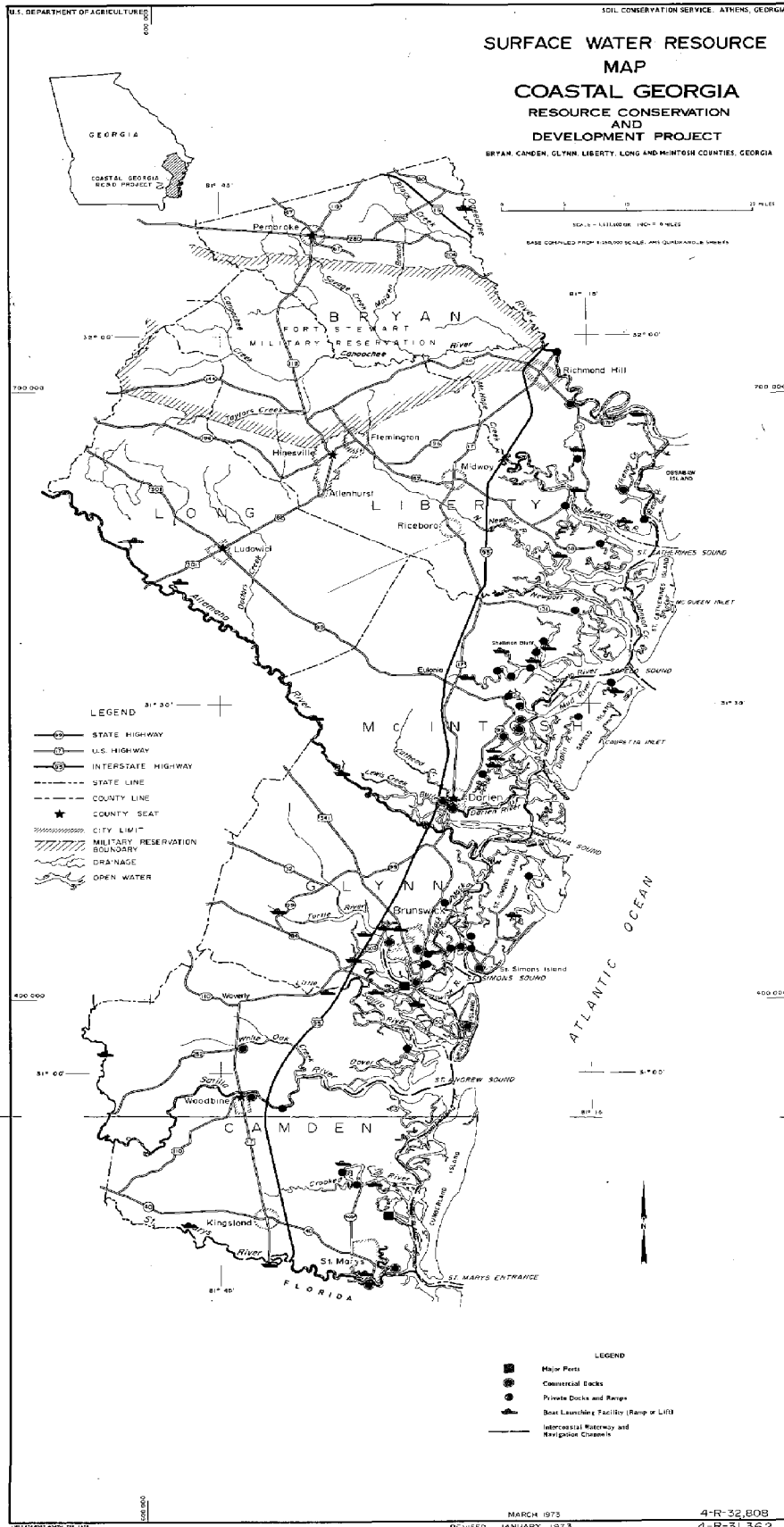
*Adequate sized roadside ditches protect roadbed and adjoining cropland.*

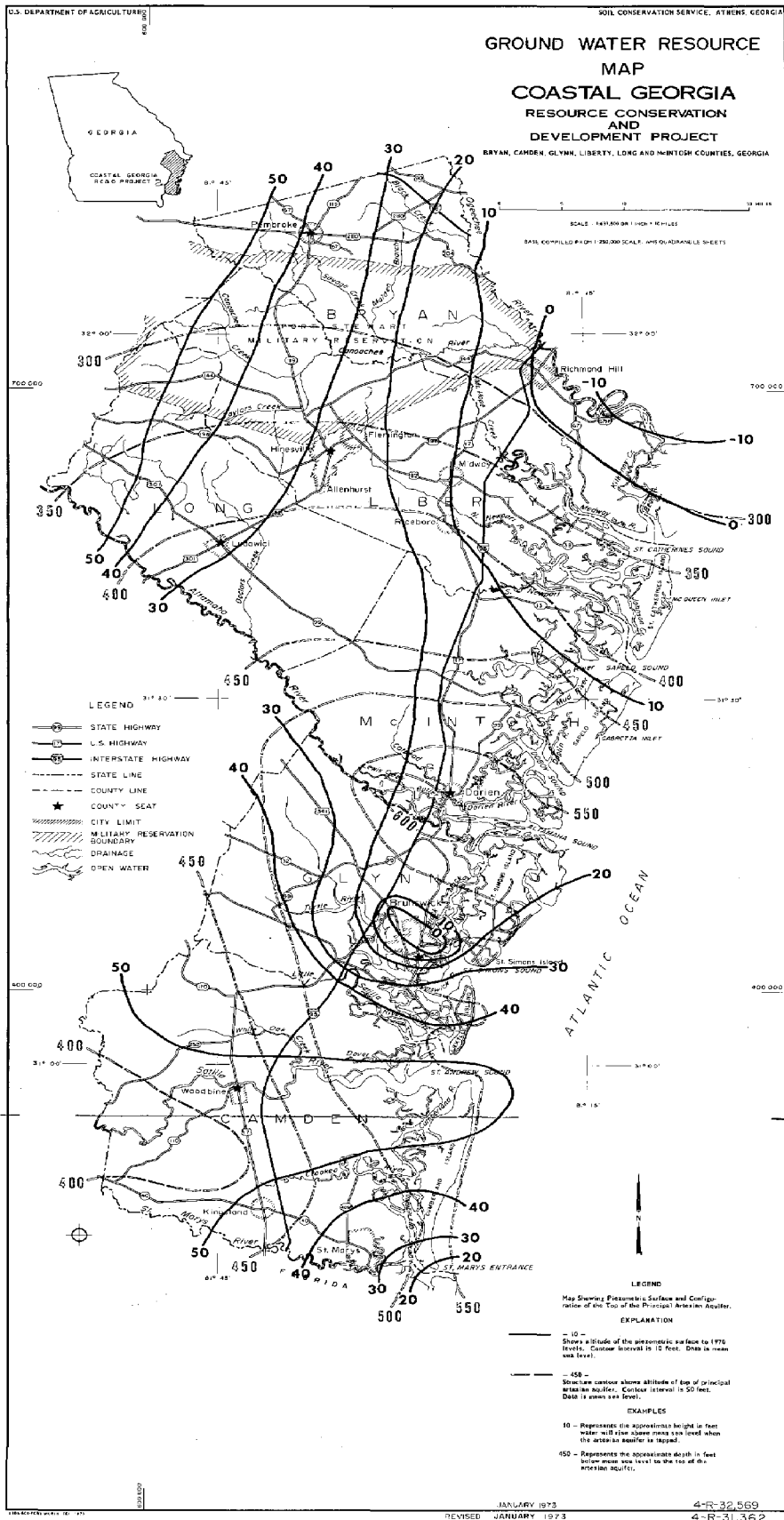


*Altamaha River overflows in Glynn County.*



*Traffic on Georgia Highway 204 stopped by Ogeechee River overflow.*





## GEOLOGY - SOIL

The surface geology and topography of Coastal Georgia were mainly influenced during formation by the rising and falling of the sea level during the Pleistocene ice ages.

Formation--At one time the ocean extended to the area which is now middle Georgia, over one hundred miles west of the present coast. Great geological changes occurred; and during the period of maximum ice formation, it is estimated that sea level was 330 feet below the present level, and the seashore was 70 to 80 miles east of its present location. The latest ice melt began about 18,000 years ago, allowing the sea level to rise to its present elevation as water returned to the ocean system.

There are traces of seven Pleistocene shorelines in the project area. These former shorelines, from oldest to youngest, are as follows: Okefenokee, 150 feet above sea level; Wicomico, 95-100 feet; Penholoway, 70-75 feet; Talbot, 40-45 feet; Pamlico, 25 feet; Princess Anne, 15 feet; and Silver Bluff, approximately 5 feet. The youngest in age and most seaward is the Holocene which constitutes the present shoreline and recent deposits which were formed within the last four to five thousand years.

The generalized cross section below, prepared along an east-west line north of Darien, shows the typical barrier island formation with associated lagoonal areas and well illustrates the predominant influence exerted on surface geology and topography.

Mineral Resources--Exploration work has been conducted in the project area by the Geological Survey of Georgia to determine the location and extent of mineral resources. Deposits of phosphates, heavy minerals, and quartz sands have been identified.

Heavy minerals of the metals titanium, thorium, and zirconium occur as sands in the area. Concentrations possibly great enough to be mined profitably have been found in at least one investigation excavation in each of the following counties: Liberty, Long, McIntosh, and Camden. Prospects have been made for phosphates in Bryan, Camden, Liberty, and Long Counties. All results to date indicate that deposits are not satisfactory for profitable mining. Sand suitable for making glass was found in one investigation excavation just outside the city of Pembroke in Bryan County. Deposits of sand suitable for construction material were also available.

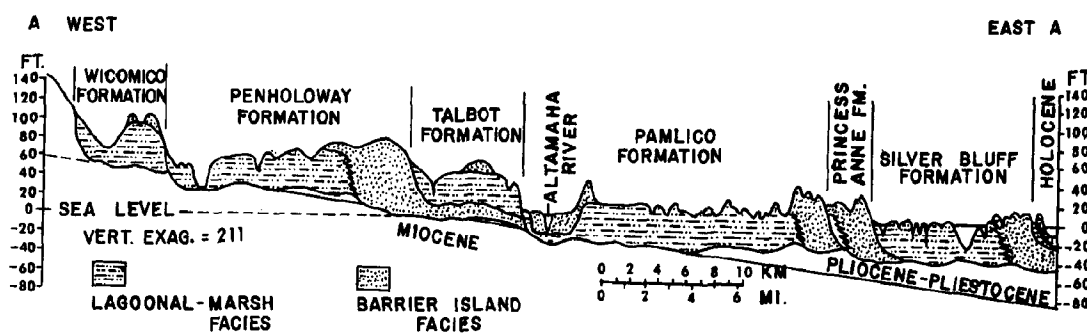
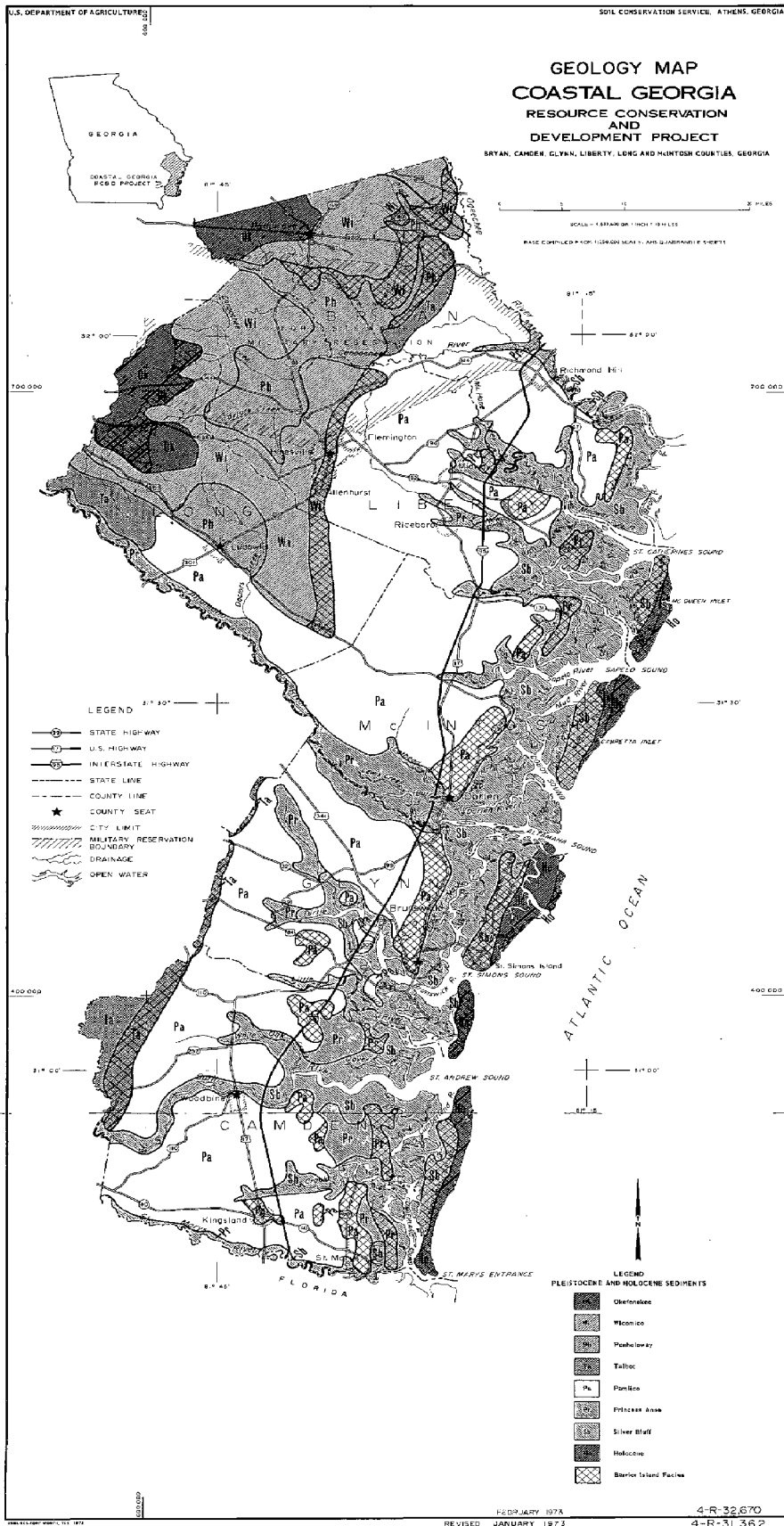


FIGURE 2

CROSS SECTION OF PLEISTOCENE AND HOLOCENE  
SEDIMENTS OF COASTAL GEORGIA



The soils of Coastal Georgia are primarily influenced by flat topography, warm humid climate, and the marine origin of soil materials.

Soil Geology--As described in the geology section, the Georgia flatwoods region was at one time covered by the Atlantic Ocean. The landscape shows a repeating pattern of barrier islands protecting tidal marshland or lagoons. Ocean breakers, currents, and sea breezes built up sand beaches and barrier islands. In the marshes and lagoons, tidal action caused varied processes, resulting in mixed and sorted clay and sand sediments.

The ocean receded at intervals, resulting in a terrace or doorstep-like landscape on a very broad scale. Consequently, soils formed on the abandoned beaches and islands are sandy, and those from the emerged marshes and lagoons are clays and sandy clays. The generalized cross section across Liberty county shown below relates to Figure 2 and establishes the correlation between previous ocean elevations and present soil conditions.

Soil Characteristics--The better drained soils occur on the abandoned beaches, islands, and areas adjacent to streams. These soils typically have a dark grayish sandy surface layer over a uniform yellow or red sandy to loamy subsoil. These soils generally have more desirable characteristics and higher potential for most uses than other soils that occur in the project area. The poorer drained soils have a black sandy to loamy surface layer overlying a gray or gray mottled subsurface layer varying in texture from sand to clay.

Natural Drainage--Climatic conditions result in high intensity rainfalls at varying intervals during the year. These rainfalls are in excess of the amount that the soil can absorb, resulting in a high seasonal water table and excess surface water. The excess surface water is removed very slowly by the nearly level topography. These factors result in a high percentage of the soils being excessively wet for extended periods of time as revealed in Table 5 below.

Table 5

EXTENT OF SOILS ACCORDING TO WEINSS PROPERTIES

County	Marshland	Swamp	Depth Below Surface to Seasonal High Water Table		
			Less than 15"	15-30"	Greater than 30"
Bryan	8%	1%	52%	30%	9%
Camden	24%	5%	40%	27%	4%
Glynn	27%	2%	60%	9%	2%
Liberty	13%	1%	51%	23%	12%
Long	---	10%	45%	28%	17%
McIntosh	30%	8%	45%	9%	8%
Project	18%	3%	50%	21%	8%

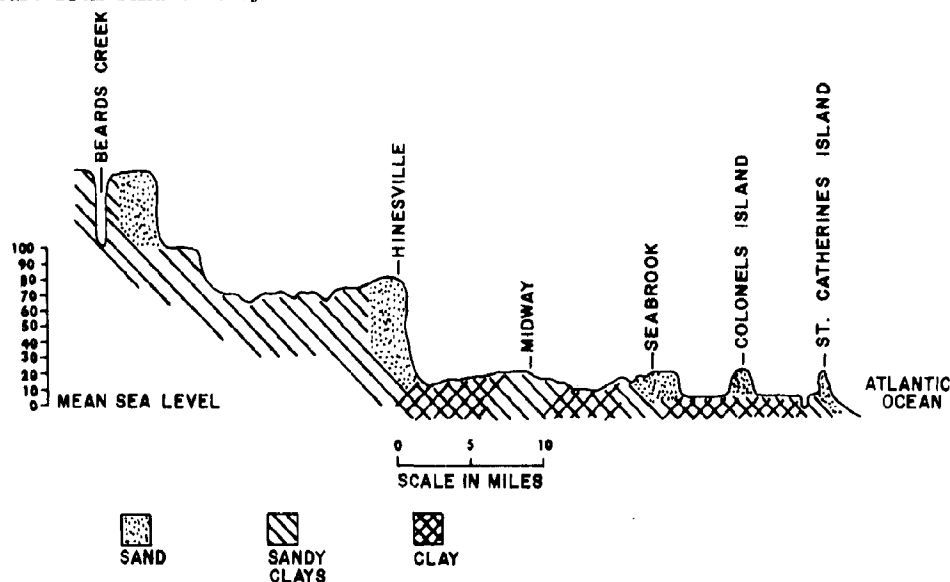


FIGURE 3

COASTAL GEORGIA RC & D PROJECT AREA LANDSCAPE  
CROSS SECTION AT HINESVILLE



*Soil - a basic natural resource.*

Soil Surveys--Since soils information is a basic requirement for intelligent land use planning, soil surveys are made and released by the Soil Conservation Service, U. S. Department of Agriculture.

For extensive broad-area planning purposes, the general soil map is made on a scale sufficient to show the pattern of soils as they occur on the landscape. A general soils map of the project area follows in this section. The accompanying soil interpretations give valuable information for general land use planning.

For more intensive planning purposes, a detailed soil survey is prepared. This soil survey is made on a scale of 1:20,000 for some counties and 1:15,840 for others. Soil surveys have long been used by agricultural land users as a basis for conservation planning and are equally applicable to other types of land use planning.

A published detailed soil survey is available for all of McIntosh County. Detailed surveys for Bryan and Glynn Counties have been completed, and surveys are being prepared for Camden, Liberty, and Long Counties.

Information contained in completed surveys is available through the Coastal and the Satilla River Soil and Water Conservation Districts and may be obtained from local Soil Conservation Service offices.

Project Opportunities--The soil and water conservation districts have an opportunity to request acceleration of soil survey activities in order to complete the detailed surveys of the remaining counties for general use.

A great need and similar opportunity exists for increasing soil interpretive assistance to specialized land users, particularly in areas subject to rapid land use changes. Commitment of funds by local governments could give priorities to soil surveys in these areas where most needed.

The RC&D program effort could create an opportunity for supplying soil interpretations as one source of the basic information needed by county and municipal planning commissions in order for them to develop comprehensive land use plans.

The RC&D project provides a framework for developing monitoring systems for soil and other resource conditions by utilizing the broad range of technology available from the participating agencies. Similar opportunities exist for initiating joint agency field studies and research projects to investigate the unique soil conditions and interpret soil characteristics of the area.



## BRYAN, CAMDEN, CLYNN, LIBERTY, LONG AND McINTOSH COUNTIES, GEORGIA



DEGREES OF LIMITATION FOR SELECTED LAND USES AND CHIEF LIMITING PROPERTIES  
OF THE THIRTEEN SOIL ASSOCIATIONS OF THE COASTAL GEORGIA ROAD PROJECT AREA

Map Symbol	Major Soil Series in Each Assoc.	Percent of Assoc.	Degree and kind of limitations for 1/ 2/ 3/	Sanitary Landfill	Local Streets and Roads	Picnic Grounds	Campsites and Play Areas	Recreation Buildings	Golf Courses	Suitability as a Source of Fertilizer	Soil Suitability for Agriculture 2/	Woodland Suitability Group 3/
1	Kershaw Oyster Coastal Beach	60 20 20	Moderate 10 Severe 11 Severe 2	Moderate 2 Severe 2 Severe 2	Moderate 10 Severe 11 Severe 2	Moderate 9 Severe 11 Severe 2	Moderate 9 Severe 11 Severe 2	Moderate 5 Severe 11 Severe 2	Severe 9 Severe 2	Good Poor 11 Poor 2	Poor 1 Poor 11 Poor 2	53 53 Unsuitable
2	Lakeland Chilchley Leon	45 25 20	Slight Moderate 11 Severe 11	Moderate 11 Severe 11 Severe 11	Slight Moderate 11 Severe 11	Moderate 9 Moderate 11 Severe 11	Moderate 9 Moderate 11 Severe 11	Slight Moderate 11 Severe 11	Moderate 11 Severe 11	Good Poor 11 Poor 11	Poor 1 Poor 11 Poor 11	462 462 462
3	Leon Rutledge	45 25	Severe 11 Severe 2,11	Severe 11 Severe 2,11	Severe 11 Severe 2,11	Severe 11 Severe 2,11	Severe 11 Severe 2,11	Severe 11 Severe 2,11	Severe 11 Severe 2,11	Severe 11 Severe 2,11	Poor 11 Poor 2,11	462 462
4	Kershaw Chilchley Rutledge	55 20 15	Moderate 10 Moderate 11 Severe 2,11	Moderate 2 Severe 11 Severe 2,11	Moderate 10 Moderate 11 Severe 2,11	Moderate 9 Moderate 11 Severe 2,11	Moderate 9 Moderate 11 Severe 2,11	Moderate 5 Severe 11 Severe 2,11	Severe 9 Severe 2,11	Good Poor 11 Poor 2	Poor 1 Poor 11 Poor 2,11	53 53 263
5	Stilwell Pelham Piquay	35 25 20	Slight Severe 11 Slight	Severe 11 Moderate 11 Moderate 11	Slight Moderate 11 Slight	Moderate 11 Severe 11 Slight	Moderate 11 Severe 11 Slight	Slight Moderate 11 Slight	Moderate 11 Severe 11	Good Severe 11 Good	Good Severe 11 Fair 1	262 262 362
6	Lakeland Pelham Masculine	35 20 25	Moderate 11 Severe 11 Severe 11	Severe 11 Severe 11 Severe 11	Moderate 11 Moderate 11 Severe 11	Moderate 11 Severe 11 Severe 11	Moderate 11 Severe 11 Severe 11	Moderate 11 Severe 11 Severe 11	Moderate 11 Severe 11	Fair 11 Poor 11 Fair 11	Fair 11 Poor 11 Poor 11	262 262 462
7	Pelham Ocala Rains	35 20 20	Severe 11 Severe 11 Severe 11	Severe 11 Severe 11 Severe 11	Moderate 11 Moderate 11 Severe 11	Severe 11 Severe 11 Severe 11	Severe 11 Severe 11 Severe 11	Severe 11 Severe 11 Severe 11	Severe 11 Severe 11	Poor 11 Poor 11 Poor 11	Poor 11 Poor 11 Poor 11	262 262 262
8	Pelham Rains Elkville	30 25 20	Severe 11 Severe 11 Severe 2,11	Severe 11 Severe 11 Severe 2,11	Moderate 11 Severe 11 Severe 2,11	Severe 11 Severe 11 Severe 2,11	Severe 11 Severe 11 Severe 2,11	Severe 11 Severe 11 Severe 2,11	Severe 11 Severe 11	Poor 11 Poor 11 Poor 2,11	Poor 11 Poor 11 Poor 2,11	262 262 262
9	Bladen Bayboro Rains	45 25 20	Severe 11 Severe 2,11 Severe 11	Severe 11 Severe 2,11 Severe 11	Severe 11 Severe 2,11 Severe 11	Severe 11 Severe 2,11 Severe 11	Severe 11 Severe 2,11 Severe 11	Severe 11 Severe 2,11 Severe 11	Severe 11 Severe 11	Poor 11 Poor 11 Poor 11	Poor 11 Poor 11 Poor 11	262 262 262
10	Elkville Jennett	60 20	Severe 2,11 Severe 2,11	Severe 2,11 Severe 2,11	Severe 2,11 Severe 2,11	Severe 2,11 Severe 2,11	Severe 2,11 Severe 2,11	Severe 2,11 Severe 2,11	Severe 2,11 Severe 2,11	Poor 2,11 Severe 2,11	Poor 2,11 Severe 2,11	262 169
11	Bayboro Rains	55 25	Severe 2,11 Severe 11	Severe 2,11 Severe 11	Severe 2,11 Severe 11	Severe 2,11 Severe 11	Severe 2,11 Severe 11	Severe 2,11 Severe 11	Severe 2,11 Severe 11	Poor 2,11 Severe 2,11	Poor 2,11 Severe 2,11	262 262
12	Swamp Johnston	80 10	Severe 2,11 Severe 2,11	Severe 2,11 Severe 2,11	Severe 2,11 Severe 2,11	Severe 2,11 Severe 2,11	Severe 2,11 Severe 2,11	Severe 2,11 Severe 2,11	Severe 2,11 Severe 2,11	Poor 2,11 Severe 2,11	Poor 2,11 Severe 2,11	262 169
13	Fidal Marsh Cypress	85 10	Severe 2,11 Severe 2,11	Severe 2,11 Severe 2,11	Severe 2,11 Severe 2,11	Severe 2,11 Severe 2,11	Severe 2,11 Severe 2,11	Severe 2,11 Severe 2,11	Severe 2,11 Severe 2,11	Unsuitable Unsuitable	Unsuitable Unsuitable	Unsuitable Unsuitable

1/ Degree of Soil Limitations:  
Slight - The degree of limitation is minor and can be overcome easily.  
Moderate - The degree of limitation can be overcome or modified by  
Severe - The degree of limitation generally requires major soil reclamation, special design, or intensive maintenance in order to accommodate the use.

2/ Numbers refer to soil feature or features affecting the use of a soil for a particular purpose. These features are:  
1. Low available water capacity  
2. Flood hazard  
3. Percolation rate  
4. Low filtering action  
5. Presumptive bearing value  
6. Permeability rate  
7. Shrink-swell potential  
8. Slope  
9. Surface soil texture  
10. Trafficability  
11. Water table

3/ Underlined ratings are the overall rating for the association.  
1/ See Table in Appendix for group description.  
2/ Total percentage does not necessarily total 100 since a part of each association is unnamed minor soils.

## AGRICULTURE

The history of Coastal Georgia agriculture is perhaps more illustrious than the present or future prospects.

Development--The earliest settlers, the Indians and later the Spanish and French, did not develop a real agriculture, but lived comfortably on harvests from the land and tidal marshes.

The early English settlers, likewise, did not develop extensive agricultural operations due to restrictive colonial policy and difficulty of bringing new land into production. Economic bounties were offered to promote production of certain commodities needed by the mother country, but in many instances for products unsuited for the conditions and soils of Coastal Georgia. Silk, wine, hemp, and flax are prime examples.

After the restrictions on land ownership as well as the use of slave labor were removed in 1750; river banks and marshland, the most fertile parts of the coast, were transformed from wilderness to extensive rice plantations. By 1800, great plantations extended along the Altamaha and Ogeechee Rivers and occupied the major coastal islands.

Sea Island Cotton became an important crop on the better drained land of these plantations after the invention of the cotton gin. During the period between the War of 1812 and the Civil War, the most intensive agriculture practiced anywhere in the United States was probably conducted in the project area. Great advances made in agricultural technology by these plantation owners were to endure with only limited refinement for over a century.

The great plantations never recovered from the Civil War. Rice continued as an important crop along the tidal areas of the project until 1890 when demand began to decline, and rice completely disappeared from the agricultural scene after 1920.

The interior of Coastal Georgia was never farmed extensively. Some of the better land was cleared, and scattered communities of small subsistence farms gradually developed within large woodland ownerships. The creation of Fort Stewart during World War II absorbed much of the best farm land in Liberty, Long, and Bryan Counties, thereby eliminating a major segment of the area's agricultural production.

Economic Conditions--By 1969 only 10.8 percent of the land area was being used for agricultural purposes; 509 farms, averaging 390 acres each, had a value of land and improvements amounting to almost \$22 million, an average of \$42,400 per farm. The value and distribution of all farm products sold in 1969 is shown below.

Changes in land use have created problems for agricultural business in the region. Good agricultural soils, in most instances, are also good for urban and industrial development. Competition for land having these characteristics results in prices which agriculture cannot afford.

Well established farms, even when not endangered by land use changes, have been subject to severe economic problems in recent years. High cost of production, poor markets, and lack of processing and storage facilities have forced many agricultural workers to seek off-farm employment. Many of these farm owners have retained the benefits of rural living by continuing to operate the farm part time as a recreational activity.

Table 7

County	Sale of Crops	Forest Products	Livestock	Total Products	Average Per Farm
Bryan	215,609	69,415	306,204	591,228	4,729
Camden	82,897	218,984	474,056	775,937	16,868
Glynn	8,054	103,499	68,091	179,644	3,592
Liberty	152,898	39,929	321,602	514,429	4,719
Long	259,437	102,200	273,077	634,714	4,317
McIntosh	12,430	350	184,486	197,266	6,164
Project	731,325	534,377	1,627,516	2,893,218	6,732

Source: Bureau of the Census 1969

Water management on cropland may consist of installation of mains and laterals, water control structures, land leveling and/or tile drains. Adequate crop management techniques, conservation cropping systems, and crop residue management practices are needed on all cultivated fields. An abundant supply of water is available for irrigation and for other agricultural needs.

Horticulture--The area has very small acreage devoted to the production of nursery stock. Opportunities exist for the establishment of a number of large wholesale nurseries. A wide variety of both field-grown and container-grown nursery stock could be produced. Major advantages are the mild winter climate, long growing season, availability of water, uncontaminated land, and the large number of people who are unemployed.

Similar opportunity also exists for the production of commercial vegetable crops where land can be properly prepared for the operation of mechanical equipment. Areas near the coast having longer growing seasons and few killing freezes would be particularly well adapted for the commercial production of a large variety of vegetables.

Production of grass sod and a number of fruit varieties offers growers an excellent opportunity for additional sources of income from agriculture. Cooperative marketing and contracting would permit several small producers to obtain the benefits of a large-scale operation.

Field Crops--Better drained soils, occurring mostly in the northwestern section of the area, are adapted to the production of tobacco, corn, peanuts, soybeans, small grains, and other field crops. About 9,000 acres of cropland are also planted to annual forage crops used for temporary grazing. Soils having high water tables are suited for crop production only with adequate water management.

A majority of soils in the region are characterized by poor natural drainage, low water holding capacity, and low natural fertility. Generally, drainage has been the determining

factor in selecting land rather than the merits of other soil properties. Most major soil series have a potential for good yields of a wide range of field crops when a high level of management is provided.

Due to level topography and small fields, water-induced soil erosion is seldom a serious problem on cropland, although both water and wind erosion do occur occasionally. Of the 34,600 acres of land being cultivated in 1968, only about 1,600 acres were soils which did not have some degree of excess water problem which limits the use of modern farm equipment and restricts the variety of field crops grown.

Commercial horticulture operations require a high level of managerial ability and skilled employees. Specialized technical assistance and vocational training programs would be required to develop necessary skills.

Pasture Land--As recently as 1954, the custom of free range was followed in which cattle roamed almost at will throughout the area. Cattle tended toward scrub or grade types which were well adapted for range conditions. The end of free range and the introduction of coastal bermuda- and bahiagrass led to both improved pastures and improved cattle herds.

Forage production is a more adapted land use on more of the coastal soils than is any major field crop. About 20,000 acres presently are used for improved pastures, and approximately 100,000 acres of marshland and timberland are utilized to some extent for periodic grazing by cattle.

Additional acreage of coastal bermudagrass is needed to supply adequate hay reserves for the present cattle herds. Commercial hay production affords a ready opportunity as another agricultural enterprise. In certain situations, additional woods range can be utilized to advantage with little damage to pine timber stands.

Excess surface water is a common problem on existing and potential pasture and hay lands. Installation of adequate water controls on soils classified as Class IIw and IIIw



*Coastal bermuda pastures provide excellent grazing.*

could make this land suitable for use as grass-land if the owners desired to increase forage production.

Livestock--The livestock enterprise affords one of the better opportunities for expanding the agricultural economy in terms of land suitability, labor requirements, and income potential for both full-time farmers and hobby farmers. The existing pastures could support an increase in the present brood cow herd of 5,700 head to 17,000 head; and beef production could be increased 200 pounds per acre on improved pastures, given complete management including adequate water management, fertilization, weed control, and herd management.

There is a good opportunity for landowners to both expand the existing dairy farms and to add new operations. Similar opportunity exists for the production of feeder pigs and poultry. The shortage of locally produced grain is some of a handicap to these enterprises, but ample supplies are available from outside the area.

Timber--About 125,000 acres of the land classified as farms is used for forest land. A majority of the approximately 220,000 turpentine faces being worked in the project area are located on this land. Income from turpentine and wood sales represents an important part of most farming operations. A detailed discussion of the forestry resource is presented in another section and is applicable to farm woodland.

Commercial Recreation--The unique natural setting of Coastal Georgia is highly conducive to outdoor recreational activities. There are abundant natural and historic attractions throughout the area which afford opportunity for further development of private recreational facilities to serve both tourists and local residents. Farmer-owned land having access to rivers, coastal estuaries, or interstate interchanges has a high potential for campgrounds, fishing facilities, cottages, hunting facilities, golfing facilities, and other tourist-oriented recreational developments. All forms of wildlife respond favorably to habitat enhancement, which the farmland owner is able to provide as either a primary or secondary land use.

The modern consumer of recreation usually demands a facility of high quality which requires a high investment. Unfortunately, the success of recreational enterprises cannot be guaranteed.

Pollution--Agricultural operations can create pollution problems. In most instances such problems are localized, but large feed-lots sometimes become sources of widespread



*Good crop yields on suitable soils.*

water pollution. Disposal and treatment methods for solving animal waste pollution problems have been devised and should be installed where large numbers of animals are fed in confined space. Other agricultural activities which may contribute to pollution problems are under study, and technology is being perfected to reduce or eliminate these problems.

Credit--Good sources of credit with realistic terms tailored to fit the investment are a basic ingredient in resource development. The lack of an extensive commercial agriculture in the coastal area could limit the financing of future agricultural development, as lenders tend to rely heavily on the success of similar existing operations. Financing from local banks, Federal Land Banks, Production Credit Association, and other commercial credit sources or from the Farmers Home Administration should be available for farmers with proven managerial ability. Prior contracting for the production or utilization of marketing co-ops would be particularly beneficial for the initial success of ventures involving new agricultural products.

Project Opportunities--One of the major objectives of the project sponsors is to improve the agricultural resource through proper agricultural land utilization, use of improved crops and livestock, and needed educational programs.

The RC&D project improves the opportunity for accelerating educational and technical assistance through existing programs of state and federal agencies. The Cooperative Extension Service is particularly well qualified to provide educational programs needed to improve production and marketing of crops and livestock.

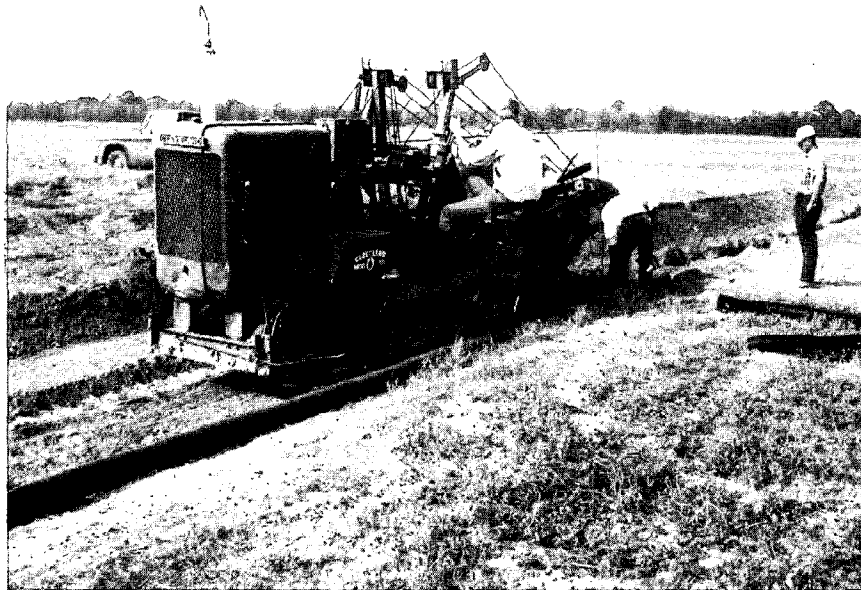
Increased agricultural production of specialized horticultural products would afford opportunities of employment in sections of the project area where unemployment is presently high.

Adequate agricultural water management affords a good opportunity to improve agricultural enterprises. Locally organized group projects afford good opportunities for landowners and agricultural communities to achieve basic water control objectives.

Opportunities for additional technical and financial assistance may develop through implementation of the Rural Development Act and other legislation which will permit accelerated application of conservation practices on agricultural lands.



*Specialty crops provide food for the hungry and employment for the producer.*



*Modern drainage tile installation improves water management.*

## FORESTRY

History--A need for products of the Georgia forest was one factor which led to establishment of the thirteenth colony. Native live oak trees were harvested for structural timbers in ship construction, and pine stands supplied a source of naval stores for the mother country from the time of the first settlements. In a later era, timber of the Georgia coast was utilized in construction of the first ships of our new nation, including "Old Ironsides."

Early lumber shipments were considered inferior by the English due to a lack of seasoning and poor manufacturing processes. However, after 1771, lumber began to be exported in volume, increasing to a peak about the turn of this century.

Virgin cypress and pine trees from the Altamaha River Basin were harvested and rafted downstream to Darien. By the early 1900's, most of the virgin forest throughout the project area had been harvested and converted by a number of giant sawmills.

The next major harvest consisted of trees not suitable for the initial harvest. The older native stands of today are the offspring from this second harvest, which were often inferior trees. The combination of poor seedling stock, species competition, and poor management practices have resulted in stands which produce below the site potential on much of the acreage remaining in native stands.

Gum naval stores have been an important companion industry to lumber operations since colonial days. Both longleaf and slash pine have been utilized for the production of gum. Earlier methods of collecting the gum flow resulted in a pitch-soaked first log, which was discarded when the tree was harvested for lumber. In present day methods, bark is removed only to the cambium layer, leaving an entire tree suitable for lumber or other use.

During the decade of the 1930's, farsighted landowners and foresters began to manipulate the forest, managing trees as a crop. During the ensuing decades, seedlings began to be produced in volume and selected for genetic characteristics; water control structures began to be utilized; and large specialized equipment was developed, which permits the present tree farming methods practiced on a large scale by industrial and progressive private woodland owners. When properly managed, the pine barrens of the interior, once considered worthless, were proven to have value as a source of materials for the pulp and paper industry. Advances in manufacturing technology during this period opened tremendous markets for new products made from Southern Pine.

Ownership--Forest land now occupies about 75 percent of the total land area or 1,342,360 acres. As illustrated graphically, 17.6 percent is in public ownership, 39.0 percent is in forest industry ownership, and 43.4 percent is in private ownership. Some of the privately owned land is under long-term lease to industry.

### COMMERCIAL FOREST LAND OWNERSHIP

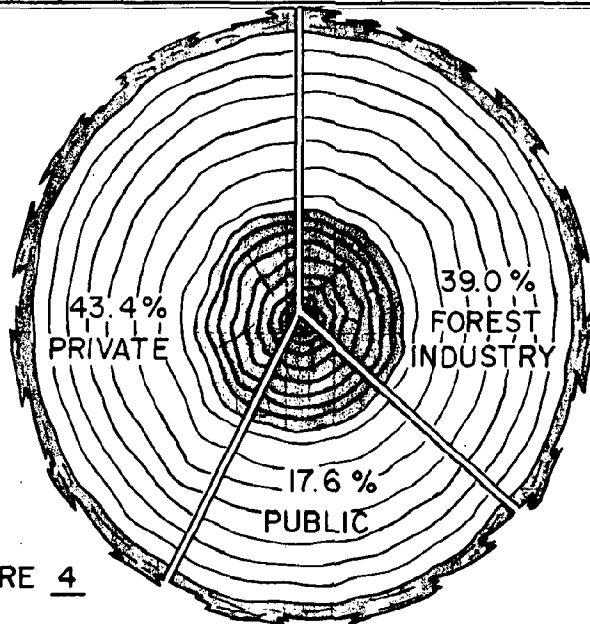


FIGURE 4

FOREST STATISTICS 1971, FOREST SERVICE, U.S.D.A.

Economic Impact--The forest industry represents the largest single economic base in the project area, employing 4,534 people in harvesting and manufacturing operations in 1970, with an annual payroll of nearly \$43 million.

Three pulp and paper mills located within the project area, plus seven mills in adjacent counties, create the most competitive market sawmills, one treating plant, two major wood-using industries, several small wood-using industries, plus exports to a broad range of markets throughout the southeast, maintain a ready market for other forest products.

One of the greater opportunities in industrial development is for industry capable of manufacturing finished wood products to complement the industry now producing basic materials. The project-wide need for new housing offers some opportunity for utilizing additional wood products locally.

Secondary Benefits--In addition to the value of commercial forestry to the general economy, trees have an important impact on many other aspects of our living. Forest conditions largely determine the number and welfare of most wildlife species. Trees are essential to nearly all forms of recreational development. Trees also improve esthetic values along roadways and building sites, providing both shade and beauty. The evergreen live oak with hanging Spanish moss and the stately pine with extra long needles and large cones make notable contributions to the unique coastal setting.

Site Suitability--Woodland suitability groups, based on soil interpretations, reveal that 34.5 percent of the total acreage currently in forest lands is best suited for mixed hardwoods, 14.3 percent is suited for both pine and hardwood, and 51.2 percent is best suited for pine. It is significant that 94.5 percent of the commercial forest land has a production potential of more than two-thirds cord per acre annually. The most prevalent soil-related problems to management are equipment restrictions and seedling mortality caused by high seasonal water tables.



*Ready market for forest products in the project area.*

Table 8

POTENTIAL ANNUAL GROWTH BASED ON SOILS (acres)

County	2+ cords	2 cords	1.8 cords	1.3 cords	.8 cords	Total
Bryan	2,400	137,795	62,970	20,955	5,435	228,550
Camden	1,940	184,090	31,280	64,070	1,810	297,190
Glynn	1,270	116,250	18,570	21,530	0	157,620
Liberty	9,010	115,710	78,560	39,770	0	243,050
Long	400	124,755	52,876	37,480	21,030	236,535
McIntosh	205	118,140	12,795	46,320	1,955	179,415
Project	29,220	796,740	257,045	229,125	30,230	1,342,360



Hardwood--About 575,000 acres, including 345,000 acres of stream bottomlands, in the project area are stocked with predominantly hardwood stands, many of which have high value as commercial hardwood forest. Repeated cuttings of high-grade hardwood trees have resulted, in many instances, in a dominant stand of low-value cull trees which prohibits development of a productive stand of the desired hardwood species. Many of these areas are ideal for coordinating bottomland hardwood management with effective wildlife management.

Economic returns from hardwood have been low traditionally, but indications now point to some future improvement. The South will be required to produce about one-half of the national supply of hardwood in the future, being the only region capable of increasing production. Accelerated technical assistance and additional research are particularly needed for more profitable hardwood management.

Tree Farming--Labor limitations, wet soil conditions, use of large logging equipment, and uncertainty of natural regeneration now make it impractical to selectively harvest and maintain a mixed-age stand in Coastal Georgia. The opportunity to control seedling stock and spacing under optimum site conditions requires the present system of even-age tree farming, which is the most efficient method of wood production ever developed. Approximately 380,000 acres have been artificially regenerated during the preceding ten years. Future harvesting equipment will also very likely require that trees be planted in rows.

Stand Establishment--In addition to current harvesting operations which need stand establishment, 352,000 acres now produce below the site potential due to inadequate stocking rates. A majority of this land is controlled by private owners of small acreages. Production on these areas could be increased to an average of at least one and one-half cords per acre per year by stand establishment and complete forest management.

Only one of the area forest industries is presently performing site preparation work on a substantial acreage of privately-owned land. Additional heavy machinery, operated either by private or industrial contractors, is essential if stand establishment goals are to be achieved.

Water Management--Some woodland soil suitability groups have seasonal excess water problems which reduce tree growth and seedling survival, limit access, and reduce other management opportunities. The pine sites presently produce very little wood and have limited value to wildlife or for any other use. With adequate surface water control, these areas will produce one and one-half cords or more per acre per year.



*Grazing - A possible extra use of timberland.*

Wildfire Suppression--Wildfires are generally a problem in the project area. The Georgia Forestry Commission and the forest industry provide adequate equipment and manpower to meet most requirements. There is a need for additional equipment and manpower to perform prescribed burning on a much larger acreage than is presently possible.

Project Opportunities--One of the major objectives of the project sponsors is to improve the area economy by the efficient use of woodland for wood production and to improve the utilization of the forest as a multiple-purpose resource.

The RC&D executive board will have an opportunity to request the Georgia Forestry Commission to provide accelerated technical assistance through the RC&D project to private landowners concerned with multiple-use management and assistance to small industries in marketing and utilization. All forest management could be carried out in accordance with a management plan developed with competent technical assistance.

The expense of establishing a stand, plus the long time required for the crop to produce economic returns, represents an insurmountable obstacle to many private landowners. Due to high taxes, high land prices, and other owner costs, it is essential that these small landowners become more efficient. Additional financial assistance from federal incentive programs would improve opportunities to retain this segment of the area economy.

The RC&D project effort can improve opportunities for additional research and studies on tree fertilization, tree diseases and insects, turpentine production, pine wetland drainage response, hardwood management, hardwood utilization, utilization of wood waste, and other woodland problems.

Increased use of prescribed burning in pine forests is needed in order to reduce fuel accumulation and the risk of disastrous wildfires. Opportunities exist for the RC&D executive board to obtain additional technical assistance and equipment to provide assistance to landowners in carrying out desired prescribed burning practices on their land.

Several timber management practices generally present opportunities to improve habitat for certain wildlife species when properly planned and applied. Site preparation stimulates the growth of grasses, sprouts, and legumes particularly beneficial to quail, turkey, deer, and nongame birds during the initial years of stand establishment and is of value to large game during the remainder of the rotation. Timber thinning and water control installations improve habitat for several species. Woodland wildlife development affords good opportunities for additional income as a supplement to timber production through annual lease or day use. Deer, hog, quail, and waterfowl habitat can be improved to support high populations of native or stocked game. In order to obtain expanded multiple use from timberland, the RC&D executive board will seek additional technical and financial assistance for joint woodland-wildlife development on privately owned land.

An opportunity will exist for improving most of the 330,000 acres of hardwood sites which are not producing the commercial timber of which they are capable. Hardwood timber not being used for veneer, lumber, and pulpwood is generally destroyed, resulting in resource waste and lost income. Markets could be established to utilize all of the hardwood stand. Improved hardwood management will consist of improving existing stands by deadening cull trees and releasing the better ones and by converting low-quality or noncommercial species to higher quality stands. Assisting foresters will have an opportunity to concentrate on providing advice and assistance to landowners to achieve hardwood management and work with industry in developing markets for low-quality hardwood timber.

Some pine forest land has potential for supplemental income from livestock when utilized for grazing. Grazing could be beneficial to some forest land by reducing understory vegetation. Technical assistance could be made available to landowners in proper grazing use as a part of multiple-use planning when appropriate.

The RC&D project improves the opportunity to assist private contractors in scheduling groups of small landowners for site preparation, tree planting, and other forestry work which would not be practical on an individual basis. Private contractors and forest industry can be encouraged to make additional equipment available to work for private landowners; and if even more equipment is needed, the Georgia Forestry Commission can be requested to provide assistance.

The RC&D executive board has an opportunity to organize a project-wide forestry committee to advise on forestry project measure needs and assist in project measure implementation.

The forestry committee and RC&D executive board have an opportunity to seek additional wood-using industry to provide more diversified wood markets, increase employment, and expand the range of products manufactured.



*Firelanes and other management practices increase forest yields and in some cases improve wildlife habitat.*

## BRYAN, CAMDEN, GLYNN, LIBERTY, LONG AND MCINTOSH COUNTIES, GEORGIA

BRYAN, CAMDEN, GLYNN, LIBERTY, LONG AND MCINTOSH COUNTIES, GEORGIA



JANUARY 1973

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## FISH AND WILDLIFE

Wildlife first occupied Coastal Georgia and utilized the land and water resources without competition until the advent of man. The presence of abundant wildlife readily available certainly must have been an important factor--perhaps a decisive factor--in the survival of early settlers.

Accounts of excursions by naturalists Mark Gatesby (1722) and William Bartram (1773) reflect their astonishment at the wide variety of species and the extent of wildlife populations observed.

As the colony developed, more and more land alterations were required to meet human needs, displacing some of the wild animals in the process of initiating agriculture and commerce. The wildlife resources--particularly the game, furbearing, and nesting animals--were exploited and abused as populations increased and settlements extended inland, resulting in a succession of governmental regulations and restrictions since the early 1800's.

In addition to the hundreds of species having large populations, six rare and endangered species are native or are occasional visitors to Coastal Georgia. The Department of the Interior classifies the Southern bald eagle, Eastern brown pelican, red cockaded woodpecker, alligator, Florida panther, and Florida manatee as being rare and endangered.

Habitat--Many factors have contributed to the diverse types and extent of the wild fishes, fowls, and terrestrial animals, including geology, climate, vegetation, and human culture.

Most wildlife species thrive along the seams of union between different habitat types, and Coastal Georgia abounds with changing environments: from the sea to marsh, to upland; from saltwater to brackish, to fresh water; from stream to swamp, to flatwoods; from marshgrass to hardwoods, to mixed stands, to pine; from forest to pasture, to fields, to urban.

Wildlife in the aggregate has an enormous capacity to adjust to changing conditions, one species often increasing as another declines.

However, a specific species usually has definite requirements and is generally incapable of making adjustments to rapid alterations in habitat. Every change in vegetation, soils, and water is reflected by changes in wildlife communities. Alterations which destroy one species may well benefit another.

More detailed and accurate information is needed to completely appraise the wildlife resource and the relationships between wildlife requirements and the utilization of other resources under Coastal Georgia conditions.

Aquatic Wildlife--About 7.4 percent of the project surface area is covered by streams, ponds, sounds, and other bodies of permanent water. The multitude of aquatic animal species native to the area also reflect the diverse nature of this habitat.

Most of the water flowing in the larger streams originates outside the project area. Water quality varies widely, but many of the streams are of excellent quality. The inland streams generally have very flat gradients and low velocities. All of the streams have moderate to excellent fish populations, including all major game species indigenous to the region.

A large number of fish species which are sought for both sport and food are present in the area waters. Fresh water fishes avidly sought by sportfishermen include: largemouth bass, crappie, bluegill, redear, warmouth, catfish, and jack. Shad and striped bass, anadromous species, offer exciting challenges for the fisherman during certain seasons. Fishing in tidal waters yields catches of flounder, speckled trout, black drum, channel bass, sheepshead, shad, whiting, tarpon, and several others.

No large freshwater impoundments are located in the project area. Many residents have a personal preference for fishing in private ponds, even though natural streams and sounds are available. Relatively few suitable impoundment sites are available, and only about 120 private ponds have been constructed in the entire project area.



*Fishing in Peacock Canal (Liberty County).*



*Bountiful salt water marshes.*

Wildlife Wetlands--About 780,000 acres or over 40 percent of the project land area consists of saltwater marshes, fresh water marshes, tidal swamps, river flood plains, basins, and flats which generally have moderate to high values as wildlife wetland. Wildlife wetland is commonly defined as land that is flooded by stream overflow or by surface water accumulations for significant periods of time with vegetative cover that is beneficial to wetland wildlife. Some wet land which would not be considered wetland for wildlife purposes may have a water table close enough to the surface to severely affect development of the land for other uses such as agriculture, forestry, or urban lands. Wildlife wetland habitat is affected principally by the interrelationship of land, water, and vegetation, which are in turn related to soil and landscape features.

These wetlands were formed under marine conditions, tidal action producing an almost level topography, and streams which flowed in both directions. After the land emerged, the streams flowed in only one direction, resulting in varying degrees of channel development. Small streams are generally sluggish and lack the well-defined channels or permanent water flows which characterize large streams flowing through the project area.

Additional investigations and interpretations are needed by agencies of the State Department of Natural Resources, U. S. Department of the Interior, and U.S. Department of Agriculture to prepare a more accurate inventory and complete description of the wildlife wetland habitat in each county of the project area.

Additional wildlife wetland data, incomplete but valid, are included in the appendix.

Wetland Types--Acre for acre, the marsh is considered to be the most valuable wildlife habitat in the project area. The great diversity within the marsh environment results in a vast array of wild creatures. The marshes have a particularly outstanding assortment of birds, including wading and shellfish-eating birds, as well as many unique amphibians and fishes. Investigators have listed about 200 genera or forms of invertebrates in the estuarine zone alone. Many of the marsh animals have significant economic values; others fill a valuable role in the food chains; and each is of scientific interest.

The flood plains, the most important inland wildlife wetland habitat, were formed under both emerged land conditions and submerged shallow marine or tidal marsh conditions. The Altamaha River and reaches of other large streams have accompanying expanses of river bottom with hardwood swamp forests, typical of the southern river terminus. Frequent inundation by floodwaters influences the life cycle and pattern of wildlife species found in this habitat. The hardwood swamps afford suitable habitat for many wildlife species, including many of the more important game animals. These swamps possess great value for recreation, education, and nature study for naturalists.

Basins and flats are depressions which lack natural outlets, accumulating surface runoff from surrounding land to become flooded during periods of heavy rainfall and losing water during periods of drought. This alternate land-water environment provides seasonal food and acceptable habitat for a number of both aquatic and terrestrial wildlife species. Many of the water animals which are produced in these flooded depressions subsequently perish as the floodwaters dissipate.

Wildlife Preserves--A number of governmental agencies and private organizations have made large expenditures to protect wildlife and preserve wildlife habitat in Coastal Georgia. A number of semi-wilderness areas which are good examples of unique wildlife habitat and other natural features have been identified and purchased by these interests, and additional acquisitions are being considered.

But few local officials favor the continued withdrawal of large blocks of land into public ownership as inaccessible preserves. Approximately 339,000 acres are presently committed for all public uses, plus the acreage held in private nature preserves. A number of private and corporate land owners have entered into agreements which permit the Georgia Department of Natural Resources to utilize private land as game management areas for public hunting. Additional incentive programs are needed which would enable private land owners to retain ownership but also preserve wildlife lands which have high wildlife value but low recreation potential.

**Wildlife Values**--In addition to the easily identifiable benefits of game-wildlife species, the non-game wildlife resource constitutes an important element of the total natural environment which makes Coastal Georgia an interesting region to visit or in which to reside.

Coastal Georgia, particularly the immediate coast, historically has been noted for its varied and extensive bird populations. The 1972 Christmas count conducted by the Coastal Georgia Audubon Society in the Brunswick area identified 157 different species of birds. The wide variety of habitat types influences not only the diversity of the wild fowl, but also contributes to the many kinds of snakes, rodents, insects, toads, salamanders, worms, crabs, turtles, and other wild creatures.

These non-game species are as attractive for investigation by the naturalists and nature enthusiasts as are the game species to sportsmen.

**Game Wildlife**--The game animals most commonly sought are deer, waterfowl, quail, squirrel, rabbit, racoon, fox, and turkey.

Deer hunting is the favorite game of most hunters. Deer populations have increased dramatically in recent years due to restocking, law enforcement, habitat improvement, eradication of the screwworm, and other factors. The estimated 1972-73 legal harvest was 2,200 deer.

Comparisons of deer population density and annual harvest figures with land use and hunting arrangements indicate that both the highest populations and greatest kills occur on leased timber land and game management areas, reflecting the habitat enhancement and better protection received.

Deer are attracted to isolated plantings of common field crops, frequently causing severe crop damage. Herds also find high quality browse plentiful in areas which have been prepared for forest regeneration, sometimes destroying young seedlings. The understory browse plants persist in pine plantations for longer periods and in far greater quantities in Coastal Georgia when prescribed burning is utilized. Some sections of the project area have extensive areas of suitable habitat for deer, but low game populations. Adequate protection and herd management could perhaps permit a twofold increase in the deer harvest within the next five years.



*Soybeans planted by Bryan County hunting club are tender eating for deer.*

Feral hogs, although not considered game animals by the Georgia Department of Natural Resources, are present in huntable populations along the major river flood plains and other large isolated areas on the mainland and on several of the islands. Hog herds are easily increased by management, but high populations are generally detrimental to other wildlife species, particularly ground nesting birds.

Turkeys require large isolated areas having mast producing mature trees. Turkey droves are present in all counties of the project area, but the increasing utilization of land for economic returns and inadequate protection pose a serious threat to the remaining scattered flocks.

Other upland game birds present in huntable numbers are doves and quail, but generally the populations are low in comparison with areas of the state which have more agriculture. The highest native quail populations occur around areas newly established in pine plantations.

Cottontail rabbits inhabit old fields, farms, and newly regenerated forest lands but are not generally plentiful in older timber stands. Marsh rabbits are abundant in some sections of marsh, but neither the marsh rabbit nor the cottontail rabbit is hunted extensively.

Squirrels are abundant in many urban areas, affording delightful entertainment for wildlife lovers. Hardwood forests along stream bottom lands have high squirrel populations which receive a moderate amount of attention from hunters.

Other furbearers have high local populations which are only moderately hunted and are seldom utilized by commercial trappers.

Waterfowl--The extensive areas of wildlife wetland in shallow ponds, streams, and tidal marshes provide excellent habitat for many species of waterfowl. The project area is located near the terminus of the Atlantic Flyway. Several of the major duck species, including mallards, bluewing teal, wigdon, black, buffle head, greenwing teal, greater scaup, pintail, lesser scaup, redhead, and canvasback, visit each winter. Few geese now reach Coastal Georgia because managed waterfowl refuges to the north have affected natural migration patterns.

The native wood duck, the only duck which regularly nests in Coastal Georgia, has been increasing in numbers for several years and can be increased significantly by management, including protection, increasing food supplies, and providing nesting areas.

A moderate population of clapper rails are residents, and additional migratory birds spend the winter in coastal marshes, upon which they are totally dependent. The rail is not presently an extremely popular game bird with area hunters; thus it affords one of the better opportunities for increasing hunting of water birds. The only management currently needed is marshland protection.

Economic Impact--The wildlife resource provides an important source of income for a significant segment of the population. The sole source of income for many residents is derived from the harvest and processing of marine wildlife. Others are employed in game management and protection. The leasing of land for hunting (as indicated on the wildlife map) is a common practice throughout the project area which produces an increasing amount of revenue for land owners.

Many others are indirectly benefited by business activity generated by the pursuit of wildlife by sportsmen and nature enthusiasts. Accurate statistics are not available to establish the direct economic impact of non-game wildlife-related travel, equipment, and supply expenditures in the project area. Fishery resources in both saltwater and fresh water are one of the most important destination-point attractions for visitors to Coastal Georgia.

The State Department of Natural Resources estimates the 1971 expenditures in the project area for hunting waterfowl at about \$429,000 and deer hunting at about \$642,000. No estimates on expenditures for other game hunting or fresh water fishing are available, but they are recognized as being an important segment of the local economy. In previous generations, furbearing wildlife provided an important source of income, but the value of the present fur harvest is insignificant due to lack of interest and satisfactory markets.

Project Opportunities--The full value of the wildlife resource has not yet been fully recognized by society or completely developed for economic returns.

The increasing interest in nature in general and wildlife in particular creates opportunities

to develop outstanding examples of unusual wildlife and wildlife habitat as tourist attractions having destination-point appeal. Local school systems and public park departments have an opportunity to jointly develop interpretative tours and displays of the unique wildlife, wildlife habitat, and nature areas found in Coastal Georgia for educational use and as tourist attractions.

One of the greater opportunities to maintain wildlife populations and diversity can be achieved by adequate protection of marshland, river swamps, and wildlife wetlands.

Individual land owners, as a primary or secondary land use, can enhance habitat for most species of wildlife by providing the required food and cover. Programs offering financial assistance would expand the opportunities to develop this wildlife resource. Owners of large tracts of major river hardwood flood plains have particularly good opportunities to establish diversified commercial wildlife enterprises.

Opportunities exist for private development of well managed shooting preserves which will appeal to the higher income sportsman. Similar opportunities also exist for developing waterfowl shooting preserves on private land in many sections of the project area.

The great public interest in wildlife creates opportunities to develop innovative incentive programs which would give private land owners an opportunity to preserve and protect land having high public values for wildlife as feeding, nesting, or resting areas.

County governments have an opportunity to receive financial assistance through the RC&D project for the creation and improvement of habitat or facilities for the production, preservation, or harvest of fish and wildlife.

Project program efforts have an opportunity to increase the technical assistance available to land owners in order to accelerate wildlife resource development.

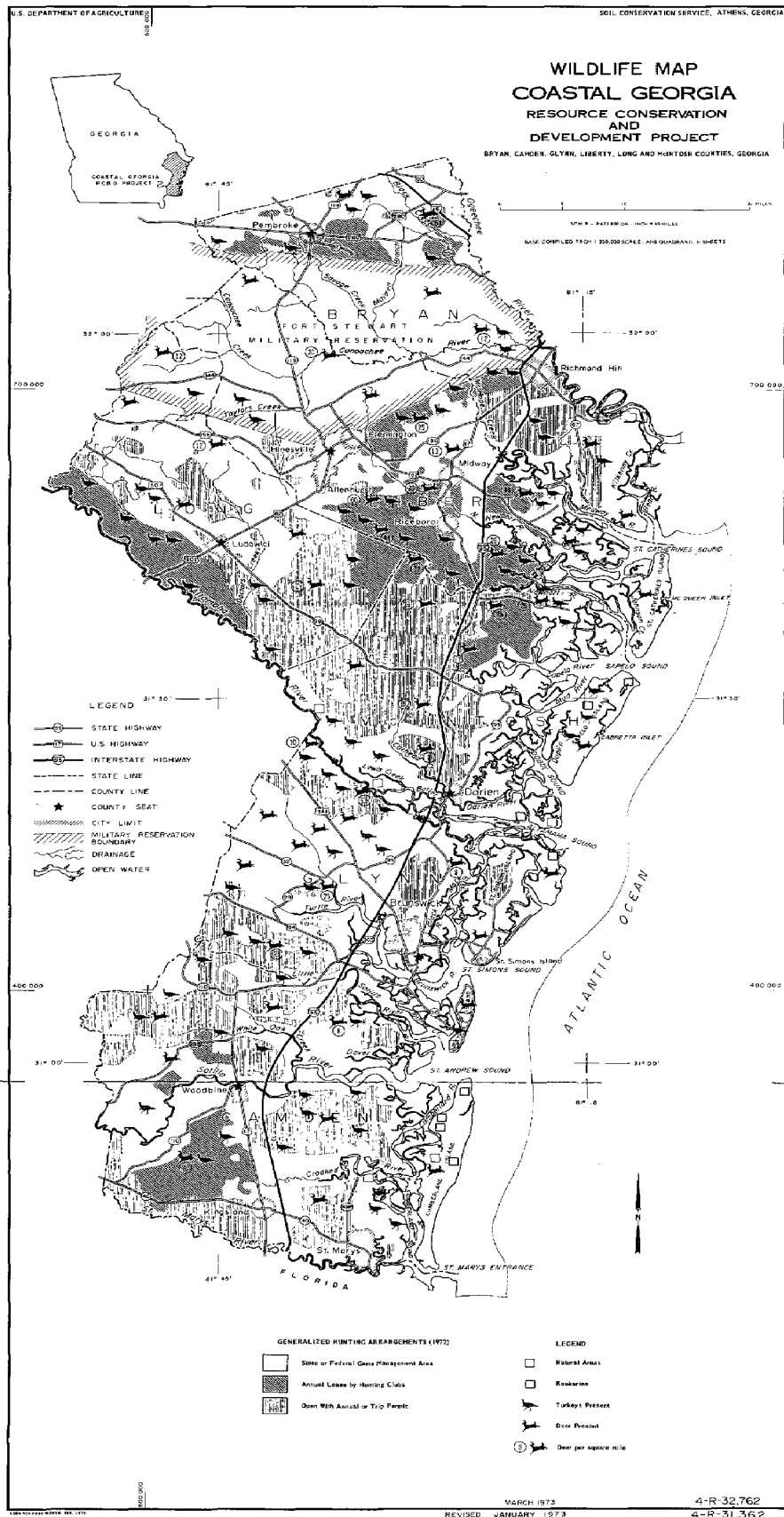
An opportunity exists to improve public understanding of wildlife requirements and the need to observe game regulations. Additional enforcement personnel and stricter prosecution of law violators would improve opportunities to develop the wildlife resource.

The RC&D project affords a good opportunity for completion of a wildlife wetlands inventory of each county by an interagency team of specialists.

There is an opportunity to develop more extensive and accurate data on wildlife populations, distribution, and habitat relationships throughout the project area by an interagency team study.

Increased use of prescribed burning in pine forests is needed to improve the habitat for deer, turkey, quail, rabbit, and many non-game species. The RC&D program could increase the use of burning for wildlife benefits by preparation of management plans and obtaining additional manpower and equipment to assist land owners.

## BRYAN, CAMDEN, GLYNN, LIBERTY, LONG AND McINTOSH COUNTIES, GEORGIA



MARCH 1973

REVISÉ JANUARY 1973

4-R-32.762

4-R-32,102  
4-R-31,362



## MARINE



*Expansive tidal marshes and streams near St. Catherine's Island.*

The marine resource literally begins at the water's edge. In addition to its value for many other purposes, the coastal marshland and associated tidal estuaries are the basic repository from which the marine resource evolves.

Tidal Marshes--A very important feature of the tideland system is the extent of the tidal fluctuation, varying from 4.5 to 10.5 feet according to season and lunar phase and having a mean range of about 6.5 feet. This great tidal amplitude creates a vigorous ebb and flow which mixes fresh and saltwater; first inundating, then exposing approximately 369,000 acres of marshland and tidal swamp in the project area twice each day.

Only in comparatively recent years has the vital relationship between marshland and the total productivity of the marine resource been adequately described. Nutrients from both land and sea are accumulated and recycled by the marsh, making it some of the most naturally productive acreage on earth. Fluctuating water elevations, high fertility levels, and constantly changing salinities combine to influence the wide range of unique plant and animal life found in the estuarine zone. The Marine Institute of the University of Georgia, located on Sapelo Island, is engaged in significant studies of marshland productivity and marsh-marine relationships.

The food chains produced in the marshland serve a vital function in the immature stages of shrimp, crabs, and many species of fish. Additional food and nutrients from the marshland enter the water system as it moves toward and into the ocean, supplying the food require-

ments of oyster, fish, shrimp, and other marine life. The marsh-estuary zone also serves as a principal nursery ground for several of the most important fishery species.

Economic Impact--Since the first days of human habitation, products from the sea have been a fundamental resource in Coastal Georgia. A substantial commercial fishery industry has existed since the early 1900's. The total commercial harvest along the entire Georgia coast in 1971 amounted to 18,409,000 pounds; with the order of value being shrimp, crab, oysters, and fish. Approximately 4,420 people were employed in 1971 by the seafood industry in harvesting, processing, servicing, and wholesaling operations.

Since the late 1940's, the processing of marine products has represented an important segment of manufacturing employment in the project area. Seventeen processing operations employed 2,940 people in 1971 to produce a 34.5 million dollar wholesale value seafood pack from locally harvested and imported raw marine products.

Additional employment and income is created by retail business, equipment sales, transportation, supply, and service trades. Several smaller ports and docks with supporting services are required by the seafood industry and fishing craft. Facilities are located at Darien, Woodbine, Bellville Bluff, Brunswick, Volona, Shellman Bluff, and Richmond Hill.

Since there is a growing demand for seafood, income and employment in the industry may be expected to increase.

Sport Fishing--While complete statistics on the economic impact of sport fishing are not available, estimates by the Georgia Department of Natural Resources indicate that about 292,000 fishermen participated in saltwater sport fishing during 1972 in the project area and made an estimated average annual expenditure of \$130 per fisherman for equipment and services. The sport fishing expenditure for harvesting this portion of the marine resource would thus create a widely spread economic activity amounting to approximately \$38 million.

Shrimp--Shrimp is Coastal Georgia's most important commercial fishery resource in terms of employment, volume, and value harvested. The 1971 catch totaled 8.8 million pounds, having a dockside value of approximately \$6.4 million.

The life cycle of the shrimp is completed in one year or less. A small percentage of survivors is required to spawn the next generation, and those surviving in excess of spawning requirements are largely wasted unless harvested. Improved harvesting methods and equipment make shrimp the only fishery which is presently effectively utilized. Additional shore support facilities are needed in some locations for orderly marketing and more efficient operation of boats.

The estuarine zone is the nursery ground and produces the food supply which directly determine shrimp populations and total harvest. Therefore, the tidelands must be protected if the shrimp industry is to prosper.

Other Shellfish--In the early years of this century, harvests of six to eight million pounds of oyster meats from the Georgia coast were considered normal. Increasingly large areas of oyster bottom were closed some years ago due to pollution contamination, but the active pollution abatement programs of industry and government have reversed this trend, and

some of the bottoms are again available. Recent monitoring of oysters along the Georgia coast indicates that many major oyster bottoms are either free of pesticides or that contaminated areas are well below permitted levels.

Additional problems of parasites, a shortage of labor, and a lack of progressive management have further reduced harvests to the point that the 1971 yield was only about 140,000 pounds. Harvesting without due regard to re-seeding the bottoms is one of the greater management problems.

Few of the oyster producers who were forced from the industry because of loss of bottoms to pollution have resumed operations, primarily due to the high labor requirements of oyster harvesting. Increased mechanization can partially offset labor requirements, but a force of semi-skilled employees is still required. Due to low wage patterns and seasonal employment, few young people are entering the industry.

The hard blue crab has long been second to shrimp as the most important commercial fishery, accounting for approximately 12 percent of the value of total landings. A modest but significant quahog fishery was utilized early in this century, but harvests gradually declined and finally ceased. Further exploration of other shellfish resources might well discover other species having commercial potential.

Finfish--The coastal habitat zone, a smooth sandy mud bottom extending to the ten-fathom depth, yields much of the shrimp catch after the shrimp depart the coastal sounds. Most of the present commercial whiting and flounder catch is entirely incidental, being taken in the trawls with the shrimp from this zone. The coastal habitat also has abundant resources of demersal fishes, some species of which primarily need only market development for exploitation.

Absence of the extensive areas of broken relief found off-shore in other regions along the Atlantic coast reduces the potential for commercial harvest of some species in the deeper waters off the Georgia coast. Exploratory trawlings by the National Marine Fisheries Service have identified areas which show moderate potential for commercial operations during certain seasons.

Snappers, groupers, porgies, croakers, and other fin fishes are known to be present in harvestable quantities but have not been fully developed as a commercial fishery. Some potential perhaps also exists for non-food species..

Potential--The market for seafood, particularly shellfish, is increasing rapidly at a time when the supply from some of these fisheries is decreasing, suggesting that considerable adjustment will occur in future price structures.

A major new industry could be developed in Coastal Georgia if the oyster bottom leases were "farmed" efficiently; planted, nurtured, thinned, and harvested for long-time productivity. Annual yields of 1,800 pounds of oyster meats per acre on natural bottoms are obtainable with consistency when given a moderate level of management.

The potential value of shellfish produced by commercial mariculture on a substantial area of the coastal tidelands is literally beyond comprehension. Advances in technology and adjustments in economic structure could lead to a major maricultural enterprise within the decade. Yields of 4,500 pounds of oyster meats per acre would be obtainable using Japanese style raft culture if practical management techniques could be perfected.

Shrimp culture has yet to become feasible, but additional research may well discover the required technology. Production of larvae in confined hatchery facilities may become an interim method of increasing the production of shrimp and certain other species for open water harvest.

Project Opportunities--One of the major objectives of the project sponsors is to increase income from and utilization of the marine resource through pollution abatement, improved facilities, and proper resource management.

The project sponsors and the RC&D executive board have an opportunity to support marshland protection programs as being fundamental to the existence of a viable fishery resource.

The RC&D executive board can lend their support to accelerated programs for marine research and exploration of the fishery resource.

The RC&D executive board will have an opportunity to support a program of financial and technical assistance for rehabilitation of selected prime oyster bottoms.

The RC&D steering committees and executive board have good opportunities to support programs for public education and to request additional enforcement personnel to protect the coastal fishery.

The RC&D executive board can request feasibility studies of economic problems and secure technical assistance for groups of fishermen who wish to form cooperatives for joint purchasing of supplies and equipment or for marketing operations.

The RC&D steering committees and executive board can help obtain assistance to improve navigation channels for the commercial fishing fleet.

## RECREATION

Perhaps because of his rural background, the typical American today demands an opportunity to enjoy frequent out-of-doors recreational activities. More leisure time and more disposable income allow more people to enjoy more activities than ever before. Young and old alike seek escape from daily routines through some form of recreation: fishing, hunting, boating, playing, swimming, riding, camping, picnicking, or just enjoying a moment with nature.

The increasing demands for recreational facilities impose new burdens on units of government on one hand and create opportunities for private enterprise on the other. Recreation-oriented industries provide jobs and income which could breathe new economic life into communities throughout Coastal Georgia.

Supply--The data presented in Table 9 reveals that critical shortages can be anticipated in several categories of outdoor recreational facilities. Although the region is richly endowed with abundant water and related natural resources suitable for recreational development, relatively minor utilization of these resources has occurred. Considerable evidence indicates that interest in meeting recreational needs is increasing in both the public and private sectors; however, a concentrated effort will be required by all concerned if the present and future recreational requirements are to be met.



*Water and sand - a place for study and fun.*

Beaches--All Georgia beaches are located on the off-shore barrier islands and constitute the greatest potential for recreational development in the area. Of the 87.4 miles of beach on the entire Georgia coast, only about 14 miles are presently available to the general public--about 9.4 miles being located in the project area. Only Jekyll and St. Simons Islands are accessible to the mainland by automobile and are the only beaches available for swimming, sunbathing, surfing, and surf casting--the more popular activities of people seeking coastal recreational experiences.

Table 9

### AREA RECREATION FACILITIES AND PROJECTED NEEDS

	<u>1972</u>	<u>1985 Needs</u>
Pools	63	87 pools
Baseball fields	11	25 fields
Softball fields	50	75 fields
Football fields	12	17 fields
Golf courses	9	14 courses
Tennis courts	44	70 courts
Camping areas	5	30 areas
Shuffleboard	5	30 courts
Picnicking	1,104	2,400 tables
Canoe trails	0	10 trails
Urban nature trails	0	7 trails
Bicycle trails	1	8 trails
Motorcycle trails	0	3 trails
Horseback trails	10	200 trails

The Golden Isles can be developed for extensive outdoor recreational use and still retain their natural character by developing them as public parks with controlled commercial development and use, as is being planned for Cumberland Island. Providing recreational opportunity for the general public on at least one additional island between Brunswick and Savannah is considered a desirable goal by the project sponsors.

Sport Fishing--Fishing is the most popular recreational activity of coastal area residents. Inland ponds, lakes, and streams provide significant angling opportunity for freshwater game species. Due to the flat topography, few good sites are available for the construction of impoundments. Where sites do occur, particularly near population centers, the potential for recreational development is good.

The coastal sounds, inlets, estuaries, and ocean waters adjacent to the barrier islands provide excellent sport fishing for several saltwater species. Artificial shoals are being constructed by the State Department of Natural Resources off the coast to attract and concentrate fish populations in formerly low-density areas. Additional shoal development over a larger area is planned. Surf fishing is also excellent, particularly where shorelines drop more abruptly into the deep waters of channels separating the islands. The commercial value of sport fishing has not been determined, but it amounts to significant expenditures for services and equipment within the project area.

Existing boat ramps and landings provide only limited access to fishing waters and are not generally sufficiently marked for use by the traveling public. The addition of fishing catwalks along bridges, construction of fishing piers, and other structures, which would permit access to tidal waters by fishermen who do not have boats, would fill a critical need for resident and visitor alike. Modern commercial establishments which could offer a complete package of bait, boats, equipment, guides, lodging, and other accommodations are needed and afford good opportunity for private development.

Hunting--Coastal Georgia has long been noted for its good hunting. Vast expanses of forested land coupled with low rural population densities create a good habitat for wildlife species suited for hunting as a recreational activity. Deer hunting commands major interest; but other species including waterfowl, squirrel, rabbit, quail, hog, and turkey, are also present in huntable populations at numerous locations.

Land ownership patterns affect availability of hunting opportunity for some of the general public. A large amount of land is held in private and corporate ownerships, many of which reserve the hunting rights for private use or for sale. A common method of sale is by annual lease to hunting clubs having 25 to 50 members each. This system provides hunting opportunity for a large number of people at reasonable cost with adequate landowner controls and wildlife conservation. The general public has access to controlled hunting events on both privately and publicly owned Game Management Areas under the supervision of the Georgia Department of Natural Resources. Similar hunting is available on the Fort Stewart Military Reservation. Other large areas of privately owned land are available on a free permit or a day fee basis.

The generalized hunting arrangement information indicated on the wildlife resource map is intended to show only the pattern of non-owner hunting as it was generally known to exist in 1972. It does not attempt to describe accurately every landholding within each delineation.

Additional habitat development by land users will increase game populations and hunting opportunity for most species as either a primary or secondary land use. A limited number of opportunities exist for operation of hunting preserves having adequate facilities and good management.

Boating--Great expanses of navigable water make the Georgia coast an ideal setting for boating and water sports as recreational activities. Pleasure boat traffic on the intracoastal waterway is heavy during certain seasons of the year.



*Adequate food and cover mean more birds.*

Boating is both influenced by and contributes to pollution problems, requiring safeguards adequate to protect coastal waters for full enjoyment of recreational boating. Additional boat launching and servicing facilities are needed for pleasure boating as well as for fishing.

Camping--Family camping is an important recreational activity for both residents and visitors. In 1970 there were approximately 2,000 campsites in 19 private campgrounds and 3 state parks. Most campgrounds offer accommodations adequate for both tent and trailer campers. Campgrounds in the project area are located either along major highways or adjacent to the coast. Highway sites are used primarily by transient overnight campers and the coastal sites by vacation campers who remain for more extended visits.

The potential is good for campground developments having high quality facilities properly located for either transient or vacation camping. Canoe trails with primitive camping facilities on the major streams offer additional recreational enterprises having good potential.

Picnicking--Family picnicking is a very popular activity either singly or in combination with other recreational activities. Additional facilities will be needed as participation in all forms of recreation increases.

Golfing--Golfing has long been an important activity at the established island resorts, but only in recent years have sufficient courses been provided to afford facilities for a significant portion of the resident population. Eight courses having 126 holes were in operation in 1972, with the greatest concentration being in Glynn County. Additional courses are anticipated in the future, particularly in conjunction with resort and residential developments along the immediate coast.

State Facilities--Three State Parks--Crooked River, Jekyll Island, and Richmond Hill--are located in the project area and provide important recreational facilities for resident and tourist alike. Total attendance in 1971 was approximately 2,340,000 people.

Playgrounds--Local units of government in the region generally recognize the need for ample playground and neighborhood park facilities for day use, responding with varying degrees of commitment. Formation and implementation of well organized county and city recreation programs with adequate staffing are essential if these important local needs are to be satisfied.

Special Facilities--Population centers have a need for public areas suitable for rifle and pistol ranges and other areas which can be

designated for use by power cycles, all-terrain vehicles, horses, and bicycles. Adequate provisions are also needed for passive forms of recreation, including nature study and hiking.

Project Opportunities--An important objective of the project sponsors is to develop recreational facilities adequate for the needs of area residents and to promote the development of recreational enterprises conducive to an expanded tourist industry.

The local leadership and the sponsors of the RC&D project have an opportunity to secure technical and financial assistance from existing governmental programs in order to develop public recreation facilities. Cost sharing could be available for land acquisition and installation of water-based recreation parks, including fishing piers, fishing catwalks along bridges, boat ramps, trails, picnic facilities, and other types of basic facilities. Planning assistance could be obtained to install the specialized facilities needed for handicapped persons in public recreation facilities.

The RC&D executive board will have opportunities to request additional technical assistance from state and federal agencies to assist private landowners in developing recreation potential for private use or commercial operation. Financial assistance through the Rural Development Act or other authorizations would increase the opportunity of many small landowners to develop the recreation resource.

The RC&D project operations present a good opportunity for county governments to request an indepth joint agency study of the recreation needs and potentials for developing county-wide recreation plans in each county.



Good potential for campground development in the project area.

creating severe limitations on land uses and serious health and environmental problems in populated areas. Topography, rainfall patterns, and geologic immaturity prevent normal water movement, sometimes requiring installation of control structures for an acceptable level of water management for many land uses. Group and community projects are usually necessary for relief, as a single land owner is seldom able to obtain an adequate outlet. RC&D matching funds and loans may be available to county governments for eligible flood prevention RC&D measures if other funds are not available. The RC&D executive board will consider additional requests for RC&D measures needed to achieve the sponsors' objectives during the course of project operations.

**BR-3301 Pembroke Area Flood Prevention Measure**

**Purpose:** To prepare the required studies and install flood prevention structures needed to improve living conditions in the area of West Pembroke.

**Sponsors:** Bryan County Commission

**CA-3302 Hi Hat Community Flood Prevention Measure**

**Purpose:** To complete engineering and other studies needed and install flood prevention measures in the Hi Hat Community to reduce urban flooding problems.

**Sponsors:** Camden County Commission

**GL-3303 Sterling Community Flood Prevention Measure**

**Purpose:** To complete engineering designs and prepare other studies needed to install flood prevention measures in the residential community of Sterling in order to reduce property damage and improve living conditions.

**Sponsors:** Glynn County Commission

**LI-3304 Gum Branch Community Flood Prevention Measure**

**Purpose:** To prepare the necessary studies and install flood prevention measures in the Gum Branch Community of Liberty County to improve living conditions.

**Sponsors:** Liberty County Commission

**LO-3305 City of Ludowici Flood Prevention Measure**

**Purpose:** To prepare designs and other necessary information and to install adequate flood prevention structures to protect the property and community health conditions of the residents of Ludowici.

**Sponsors:** Long County Commission

**MC-3306 Ridgeville Area Flood Prevention Measure**

**Purpose:** To make the required studies and install flood prevention structures needed to protect the residential area and improve living conditions.

**Sponsors:** McIntosh County Commission

**Problem:** Periodic flooding, storms, and normal tidal influence on coastal streams produce critical streambank erosion, threatening to alter channel locations, undermining and eventually destroying adjacent fixed improvements and producing

large volumes of sediment which accumulate in coastal estuaries. Additional research and engineering experimentation are needed to improve methods for treatment of accelerated streambank erosion. The RC&D executive board will consider RC&D measure proposals in consultation with the U.S. Corps of Engineers to insure that accepted RC&D measures meet project objectives of broad public benefits at reasonable cost.

**BR-3401 Seven-Mile Bend Bluff Erosion Treatment**

**Purpose:** To stabilize the eroding sections of the Ogeechee River at the neck of the "Seven-Mile Bend" to prevent bluff erosion damage to adjacent property and the development of a new channel which would result in extensive ecological changes in the lower reaches of the river subject to tidal action.

**Sponsors:** Bryan County Commission

**Associated Measures**

**Problem:** None of the counties and few municipalities have developed and/or fully implemented land use plans. Rapid land development in some communities has created general public interest in improving existing land use planning activities and for initiating planning where no action has occurred. County-wide land use plans are needed in order to complement and adequately protect municipal planning agencies. Soil interpretations are very important in planning land use in the area because of widespread soil-related problems. Technical assistance is needed from the agencies having expertise in various disciplines relating to land use policy, planning, and regulations. The RC&D executive board will give highest priorities to completion of county-wide plans which will provide a foundation upon which municipal plans can be formulated. Additional RC&D measures will be considered as other units of government decide to implement land use plans.

**BR-5101 Bryan County Land Use Plan**

**Purpose:** To develop an acceptable land use plan and implementing regulations which will protect the individual land owner and guide community development.

**Sponsors:** Bryan County Commission

**BR-5102 Pembroke Land Use Plan**

**Purpose:** To prepare and implement an acceptable land use plan which will result in more efficient development and a better environment for the people.

**Sponsors:** City of Pembroke

**BR-5103 Richmond Hill Land Use Plan**

**Purpose:** To prepare and implement an acceptable land use plan which will protect the individual land owner and result in sound community development.

**Sponsors:** City of Richmond Hill

**CA-5104 Camden County Land Use Plan**

**Purpose:** To implement an acceptable land use plan and related regulations which will serve to protect the individual land owner and guide community development.

**Sponsors:** Camden County Commission

returns from investments in wildlife habitat enhancement measures. Additional on-site technical assistance is needed from specialists to install planned wildlife management measures. The RC&D executive board will develop priorities of most promising opportunities periodically and request additional assistance from participating state and federal agencies.

**PA-1701 Accelerated Wildlife Application Measure**

**Purpose:** To secure additional wildlife biology assistance from the Soil Conservation Service in order to implement planned wildlife enhancement practices throughout the project area. Initial activities will be directed toward accelerating application of measures needed to develop commercial wildlife-recreation enterprises, develop private waterfowl projects, and upgrade leased wildlife land holdings.  
**Sponsors:** Coastal Soil and Water Conservation District, Satilla River Soil and Water Conservation District

**Problem:** Many USDA agencies are unable to staff full-time offices in project area counties. The large percentage of part-time farmers further complicates normal communications with USDA agencies. Additional staffing is needed to provide the full range of USDA services. The number and diversity of counties in the project area create additional problems of communication between agencies, land owners, and RC&D leaders. Additional educational assistance is needed to improve overall communications within individual counties and between counties in the project area.

**PA-1801 Accelerated Education and Information Program**

**Purpose:** To provide additional extension services in the form of a communications and public information specialist in the project area to adequately inform area residents of USDA programs in general and RC&D project opportunities in particular.  
**Sponsors:** RC&D Executive Board

**Problem:** Many locations lack adequate parks and other facilities to provide recreation opportunities needed by residents and tourists. Technical and financial assistance are especially needed to develop public water-based recreation facilities. County governments may be eligible for RC&D matching funds and loans for developing public water-based recreation parks. The RC&D executive board will consider additional requests for RC&D measures needed to meet county needs over the period of project operations.

**PA-3101 Fishing Structure Study**

**Purpose:** To determine feasibility and to seek cooperation of the State Highway Department in permitting the utilization of abandoned bridges as fishing piers and to add catwalks along other bridges, and to determine feasibility of constructing fishing piers to permit safe access to fishing waters. Feasible developments will be adopted as specific RC&D measures by the RC&D executive board.  
**Sponsors:** RC&D Executive Board, RC&D Wildlife Committee

**PA-3102 Study of Canoe Trails**

**Purpose:** To provide technical assistance to develop publicly or privately operated canoe trails with primitive camping accommodations along reaches of the major rivers. Specific RC&D measures will be adopted for feasible and desirable projects by the RC&D executive board.  
**Sponsors:** RC&D Executive Board, RC&D Wildlife Committee

**BR-3103 Recreation Park Facilities**

**Purpose:** To provide technical and financial assistance to purchase suitable sites and develop county parks with emphasis on expanding water-based recreation.  
**Sponsors:** Bryan County Commission

**CA-3104 Recreation Park Facilities**

**Purpose:** To provide technical and financial assistance to purchase suitable sites and develop county parks with emphasis on expanding water-based recreation.  
**Sponsors:** Camden County Commission

**GL-3105 Recreation Park Facilities**

**Purpose:** To provide technical and financial assistance to expand and develop adequate basic facilities at the Altamaha River county park.  
**Sponsors:** Glynn County Commission

**LI-3106 Recreation Park Facilities**

**Purpose:** To provide technical and financial assistance to secure suitable sites and develop county parks with emphasis on expanding water-based recreation.  
**Sponsors:** Liberty County Commission

**LO-3107 Recreation Park Facilities**

**Purpose:** To provide technical and financial assistance to secure suitable sites and develop county parks with emphasis on expanding water-based recreation.  
**Sponsors:** Long County Commission

**MC-3108 Recreation Park Facilities**

**Purpose:** To provide technical and financial assistance to secure a suitable site and develop a county park with facilities for water-based recreation.  
**Sponsors:** McIntosh County Commission

**Problem:** Natural wildlife wetland and other wildlife sites are not being developed for full wildlife potentials. Wildlife enhancement practices and proper management would greatly increase the wildlife benefits from these sites. RC&D matching funds and loans for eligible public wildlife developments may be available to county governments if other funding cannot be secured. The RC&D executive board will consider additional RC&D measures for wildlife development as requested during the period of project operations.

**LI-3201 Wildlife Development**

**Purpose:** To establish a green tree reservoir with sufficient land and support facilities to produce and harvest waterfowl.  
**Sponsors:** Liberty County Commission

**Problem:** Precipitation-induced surface flooding, stream flooding, and/or soils having seasonal high water tables less than 30 inches below the surface occur on about 92 percent of the project area,



board, in consultation with the RC&D forestry committee, will establish priorities on forestry program needs for application assistance in conjunction with forestry planning assistance as a basis for requesting accelerated assistance from the U. S. Forest Service and Georgia Forestry Commission. Specific program operations involving RC&D accelerated services funds will be developed in annual plans prepared jointly by the Soil Conservation Service and the assisting forestry agencies.

PA-1401 Accelerated Forest Land  
Treatment Measure

Purpose: To increase technical assistance available to private land owners throughout the project area for implementation of forest management plans which will result in better utilization of forest lands, increasing land owner returns, and expanding area employment opportunities. Initial operations will emphasize assistance to regenerate tree stands on privately owned lands.

Sponsors: RC&D Executive Board,  
RC&D Forestry Committee

Problem: Extensive problem soils throughout the project area create a critical requirement for soil interpretations by all land users, particularly for private urban land use developments, individual agricultural and forest land use planning, and as basic information for comprehensive county and municipal land use planning decisions. Additional research and field studies are needed to further refine woodland soil interpretations of site potential and site treatment in order to effectively utilize the forest soil resources. An accelerated monitoring program is needed to provide information on soil degradation resulting from flooding, erosion, and improper land use. Priorities for soil resource data requirements will be established annually by the RC&D executive board and used as the basis for requesting accelerated services from the Soil Conservation Service.

PA-1501 Highway Impact Soil Survey  
Measure

Purpose: To accelerate soil surveys and preparation of interpretations needed to accomplish accelerated conservation planning and application measures in high priority areas relating to interstate highway impact.

Sponsors: Coastal Soil and Water Conservation District, Satilla River Soil and Water Conservation District

PA-1502 Public Land Use Soil  
Interpretation Measure

Purpose: To accelerate soil surveys and preparation and publication of special interpretations needed by local planning commissions in establishing local land use policies and developing land use plans. Initial activities will be concentrated on supplying soils data in communities which do not have published soil surveys and are experiencing rapid urbanization, particularly in Glynn, Camden, Bryan, and Liberty Counties.

Sponsors: Coastal Soil and Water Conservation District, Satilla River Soil and Water Conservation District

CA-1503 Interim Soil Survey Report

Purpose: To complete the detailed soil survey and appropriate interim interpretations for Camden County pending publication of the detailed soil survey report.

Sponsors: Satilla River Soil and Water Conservation District

GL-1504 Interim Soil Interpretation  
Report

Purpose: To prepare special soil interpretations based on the completed Glynn County Soil Survey, and make information available to the public pending publication of the detailed soil survey report.

Sponsors: Satilla River Soil and Water Conservation District

LI-1505 Interim Soil Survey Report

Purpose: To complete the detailed soil survey and prepare interim soil interpretations for Liberty County pending publication of the detailed soil survey report.

Sponsors: Coastal Soil and Water Conservation District

LO-1506 Detailed Soil Survey

Purpose: To complete the detailed soil survey and soil interpretations for Long County.

Sponsors: Coastal Soil and Water Conservation District

Problem: The wildlife resource has not been adequately developed or fully utilized to produce potential economic or social benefits. Accelerated wildlife planning assistance is needed in order to assist private land users in developing adequate plans for non-game and game wildlife enhancement measures as a primary or secondary land use. Specialized planning assistance is particularly needed to develop commercial wildlife-recreation enterprises and to plan wildlife enhancement practices on lands leased by hunting clubs. The RC&D executive board will request additional assistance of state and federal agencies after periodically establishing priorities of most pressing problems.

PA-1601 Accelerated Wildlife Planning  
Measure

Purpose: To increase biology assistance to land users from the Soil Conservation Service in order to adequately plan for wildlife resource development as a primary or secondary land use. Wildlife planning will be coordinated with conservation planning and woodland planning activities throughout the project area to promote multiple use of these lands to develop wildlife potential to the maximum extent possible.

Sponsors: Coastal Soil and Water Conservation District, Satilla River Soil and Water Conservation District

Problem: Wildlife values have become important and are expected to increase rapidly in the future, but many land owners have not yet adjusted their operations to include wildlife enhancement. Game-wildlife, particularly, has become a marketable resource which will yield economic

**Problem:** A large percentage of the land area cannot be fully utilized without the installation of soil and water conservation measures and management systems. All project area soils, inclusive of slopes and urban land, are subject to severe erosion and other management problems. Intensive land developments generally require the installation of extensive conservation measures specifically planned for the site. Accelerated technical and financial assistance, including long-term conservation contracts, is needed to implement conservation planning decisions which will develop natural resources and achieve project sponsors' objectives. A continuing land inventory and monitoring program on soil, water, and related resources is needed to provide current data for both private and public resource development. Priorities will be established by the RC&D executive board annually as the basis for requesting accelerated application assistance in conjunction with accelerated planning assistance from all the participating agencies.

**PA-1201 Interstate Impact Application Measure**

**Purpose:** To accelerate technical assistance to land users who need assistance to apply planned conservation measures and develop management systems. Accelerated conservation application assistance from the Soil Conservation Service will be coordinated with conservation planning activities and concentrated on high-priority areas relating to interstate highway development, including residential, recreational, commercial, industrial, and community conservation problems.  
**Sponsors:** Coastal Soil and Water Conservation District, Satilla River Soil and Water Conservation District

**PA-1202 Critical Area Inventory**

**Purpose:** To inventory additional areas of unprotected land which results in erosion damage, silt-polluted runoff, and degrades downstream watercourses. Following identification, the RC&D executive board will consider additional RC&D measures to obtain adequate treatment of critical areas throughout the area.  
**Sponsors:** Coastal Soil and Water Conservation District, Satilla River Soil and Water Conservation District

**BR-1203 Roadbank Stabilization**

**Purpose:** To provide technical and financial assistance to establish vegetation on approximately 40 acres of eroding highway rights-of-way in Bryan County.  
**Sponsors:** Bryan County Commission

**GL-1204 Urban Impact Application Measure**

**Purpose:** To accelerate technical assistance to land owners in sections of Glynn County from the Soil Conservation Service needed to install planned conservation measures. Accelerated application assistance will be concentrated on problems directly relating to urban expansion around the metropolitan area of Brunswick. Conservation measures to achieve adequate sediment and water controls are specifically needed for residential, recreational, and commercial land uses.  
**Sponsors:** Satilla River Soil and Water Conservation District

**GL-1205 Highway Right-of-Way Stabilization**

**Purpose:** To secure technical and financial assistance to treat approximately 55 acres of eroding highway rights-of-way in Glynn County.

**Sponsors:** Glynn County Commission

**Problem:** The forest resource is an important segment of the area economy that is not producing at full potential. Few forest lands are being managed for maximum wood production, and privately-owned lands generally have the lowest level of management. Additional technical assistance is needed to assist these private land owners in developing management plans as a guide for improving forest land utilization. Many wood processing industries have both operating problems and opportunities to produce new products which require competent technical assistance in order to obtain full economic returns from the forest resource. Priorities on program requirements for forestry planning assistance will be established annually by the RC&D executive board, in consultation with the RC&D forestry committee, as a basis for requesting accelerated assistance from U. S. Forest Service and Georgia Forestry Commission. Specific program operations requiring RC&D accelerated services funds will be developed in annual plans prepared jointly by the Soil Conservation Service and the assisting forestry agencies.

**PA-1301 Accelerated Forest Management Planning Measure**

**Purpose:** To increase technical assistance available to private land owners for the preparation of forest management plans throughout the project area. Initial planning activities will be provided to owners of forest lands having high priority problems relating to hardwood production, multiple-use management, and regeneration of understocked stands.  
**Sponsors:** RC&D Executive Board, RC&D Forestry Committee

**PA-1302 Accelerated Assistance to Wood Processors**

**Purpose:** To increase technical assistance to forest product processors to improve manufacturing techniques and expand markets for wood products. Initial program efforts will be concentrated on utilization of low quality hardwood and on reducing the amount of other wood presently being wasted in harvesting and processing.  
**Sponsors:** RC&D Executive Board, RC&D Forestry Committee

**Problem:** Seventy-five percent of the project land area is devoted to forest, 43.3 percent of which is privately owned and which generally receives the lowest level of management. Owners of small tracts experience greatest difficulty in following sound management practices, in obtaining good markets, in financing stand regeneration, in contracting for forest treatment, and in other production problems. Additional technical assistance is needed to coordinate and supervise the application of planned treatment and management measures for individuals and groups of private land owners. The executive

## MEASURE PROPOSALS

The following RC&D measure proposals were recommended by county steering committees and adopted by the executive board during the planning phase for inclusion in the initial plans of work. Many of these proposals are project-wide or county-wide in scope, and subsequent evaluation may require the establishment of a number of more specific RC&D measures in order to implement the original proposal. The designated measure sponsors will require assistance from participating groups and agencies in order to implement the measures. The numbers assigned to each proposal are for identification purposes only and are not intended to indicate operational priorities.

### Land Use Treatment Measures

**Problem:** Severe limitations on land use result from natural soil and water conditions which require conservation planning assistance for land users to make needed land use and treatment decisions. Land development is expected to occur in communities throughout the area, with most rapid development projected along the immediate coast, around the Brunswick urban center, and in areas adjacent to interstate highway interchanges. Additional technical assistance and resource data are needed from all appropriate agencies for orderly private and public land development and achievement of RC&D sponsors' objectives. Priorities will be established by the RC&D executive board annually as the basis for requesting accelerated services from participating agencies.

#### PA-1101 Interstate Impact Planning Measure

**Purpose:** To accelerate preparation of conservation plans by private land users by providing additional technical assistance from the Soil Conservation Service. Accelerated conservation planning assistance will be concentrated on problems of intensive land use developments resulting directly from impact of interstate highway access. Land use changes to residential, commercial, and recreational uses will receive special consideration as being high priority problems during the first five years of interchange development.  
**Sponsors:** Coastal Soil and Water Conservation District, Satilla River Soil and Water Conservation District

#### PA-1102 Public Land Use Planning Assistance

**Purpose:** To increase conservation planning assistance from Soil Conservation Service to local governments in order to provide basic land resource data needed by local people and the other assisting agencies engaged in the preparation of public land use policy and land use plans. Initial accelerated service assistance will be concentrated on furnishing technical information for county land use plans in Bryan, Liberty, and Glynn Counties.  
**Sponsors:** Coastal Soil and Water Conservation District, Satilla River Soil and Water Conservation District

**PA-1103 RC&D Measure Planning Assistance**  
**Purpose:** To increase technical assistance from Soil Conservation Service to project sponsors and sponsors of RC&D measures for

the preparation of RC&D measure plans. Accelerated assistance will be directed toward securing and evaluating data and preparing plans for feasible RC&D measures as requested by the executive board and the RC&D measure sponsor.  
**Sponsors:** Coastal Soil and Water Conservation District, Satilla River Soil and Water Conservation District

#### PA-1104 Aerial Photography

**Purpose:** To purchase the most recent photographic coverage available in order to improve conservation planning assistance and expedite soil survey activities.  
**Sponsors:** RC&D Executive Board

#### PA-1105 Base Maps

**Purpose:** To obtain a family of base maps for each county to facilitate planning procedures and provide adequate maps for use by units of government.  
**Sponsors:** RC&D Executive Board

#### CA-1106 Accelerated Planning Assistance for Camden County

**Purpose:** To accelerate conservation planning assistance by the assignment of a full-time soil conservationist to assist private land users and units of government. Increasing urban development and more intensive use of all land result in requests for planning assistance which cannot be supplied by the present part-time staff arrangement.  
**Sponsors:** Satilla River Soil and Water Conservation District

#### GL-1107 Urban Impact Planning Measure

**Purpose:** To accelerate conservation planning assistance to land users of Glynn County from the Soil Conservation Service. Accelerated planning assistance will be concentrated in areas undergoing rapid land use changes resulting from urban expansion of the city of Brunswick.  
**Sponsors:** Satilla River Soil and Water Conservation District

#### LO-1108 Accelerated Planning Assistance for Long County

**Purpose:** To accelerate conservation planning assistance by the assignment of a full-time soil conservationist to assist private land users and units of government. Increasing urban development and more intensive use of all land result in requests for planning assistance which cannot be supplied by the present part-time staff arrangement.  
**Sponsors:** Coastal Soil and Water Conservation District

## PROPOSED RC&D MEASURES



This section enumerates in brief form the RC&D measure proposals which have been submitted by the local people, recommended by the county steering committees, and approved by the executive board. A RC&D measure is a specific activity which when properly adopted and completed will help meet the project objectives.

The measure proposals which have been adopted are not intended as a final or complete program package. The very concept of RC&D is one of "open ended" identification of problems, then planning and subsequent implementation of feasible solutions. The executive board will carefully analyze each measure proposed to insure that it conforms with the project objectives. Few of the proposed measures listed have been sufficiently evaluated during the course of preparing these Guidelines For Development to determine feasibility.

The executive board will request technical assistance from cooperating agencies to adequately evaluate and plan the proposed measures with the RC&D sponsors. Technical and financial assistance will be sought in the same manner to assist measure sponsors in implementing the measures which are determined to be desirable and feasible and approved for operations by the executive board.

For purposes of simplification and consolidation, RC&D measures are sometimes classified by the nature of the activity and the source of needed assistance. Coastal Georgia RC&D measure proposals are classified under the following general categories:

### Land Use and Treatment Measures

1000-2000 - Measures needed to implement land use adjustments, conservation, and resource development on private and public lands. Many public agencies will be requested to increase levels of technical assistance to the project area, but these services are designated as accelerated service measures only where authorized and funded by RC&D funds. The local soil and water conservation district is a major agency for securing assistance from state and USDA agencies.

3000-4000 - Measures having significant group or community benefits and requiring local group action for implementation. Agencies of the U. S. Department of Agriculture and U. S. Corps of Engineers are major sources of assistance.

### Associated Measures

5000-6000 - Measures designed to improve the utilization, marketing, or processing of a natural resource. State agencies are major sources of assistance.

7000-8000 - Measures designed to accelerate economic growth and enhance social conditions which only indirectly relate to the development of natural resources. The Coastal Area Planning and Development Commission is a major source of planning assistance and is the responsible agency in securing sources of financial assistance from state and federal agencies.

## Section V

# RC&D MEASURES

## IMPLEMENTING THE PLANS

Preceding sections of this document describe briefly the Coastal Georgia Resource Conservation and Development Project area and discuss in considerable detail the condition of the various resources. During the course of systematically evaluating these resources, many problems have been identified by the various committees, and some development opportunities have been suggested at the conclusion of the respective resource sections.

Although these evaluations and suggestions may well be valid and contribute to a better understanding of resource relationships, they alone contribute nothing to improving the quality of living in the area. Action will be necessary to produce tangible results.

This plan of action is the initial effort of the executive board to select from alternative proposals received during the planning stage the measures which appear to contribute most to achievement of the project objectives.

Local Participation--The RC&D project provides an opportunity for different resource interests to be represented in the decision-making process to insure maximum benefits from resource development for all the people. Any citizen or group is encouraged to make recommendations to the respective county steering committees for consideration. Representatives of the appropriate governmental or private resource agencies will serve as technical advisors to the steering committees and the executive board to achieve mutual objectives of resource utilization.

The final decision-making responsibility and the leadership required to implement RC&D measures is vested in the sponsors. County commissions have authority to assess and collect taxes at the local level and will be expected to provide funds for implementation of some of the RC&D activities.

Major Policies--To ensure a wide range of interest in project planning and development activities, RC&D steering committees will represent the people and their governing bodies in each county. Steering committee members, appointed annually, should have a good working knowledge of resource conditions and be sensitive to the aspirations of the other residents.

The executive board, composed of representatives from the county steering committees, will assume leadership responsibility for project activities on behalf of the sponsors. The board will receive RC&D measure proposals from the steering committees, evaluate and assign priorities, and request technical and financial assistance from governmental agencies and others as needed and appropriate to achieve the objectives of the sponsors.

Project sponsors are very cognizant of the limitations on resources at their direct disposal for implementing the RC&D measures which may be requested during the course of project operations. Pledges of assistance have been received during the initial planning stages from a wide range of public resource agencies and private groups. That assistance will be essential to achieving a desirable rate of resource conservation and development progress.

The Coastal Area Planning and Development Commission, a sponsor of the RC&D project, is the responsible substate planning agency providing planning assistance to counties and towns in the project area. All RC&D measures will be coordinated with commission program efforts. The commission staff will provide a primary source of counsel and assistance to the other agencies which participate in project activities. RC&D measures in the broad range of community facilities and economic development will be directed to the planning commission for assistance; the only role of the RC&D executive board will be one of initiating and supporting these measures.

RC&D measures for developing land, water, and related natural resources will be implemented in cooperation with the appropriate state and federal agencies, with technical and financial assistance that may be available through existing programs. RC&D funds will be utilized for accelerated technical assistance and eligible RC&D measures when funding is not available from other sources. Eligible flood prevention measures and water resource development projects will continue to be installed under operational provisions of the Small Watershed Act (P.L. 566) and authorities delegated to the U.S. Corps of Engineers in partnership with local sponsors.

The executive board has adopted a policy statement supporting comprehensive land use planning as being the most desirable method of achieving development and proper conservation of the land resource. The county commissions have legal authority to establish county planning commissions which could implement county-wide land use plans in their respective counties.

The Coastal Area Planning and Development Commission, the soil and water conservation districts, and the community development affiliates of the University System of Georgia will cooperate in providing the county planning commissions with technical assistance needed to develop land use plans.

## OBJECTIVES OF THE PROJECT

The ultimate goal of the Coastal Georgia Resource Conservation and Development Project is to create a quality environment for both rural and urban people by the prudent use, management, and protection of our natural resources. To achieve this goal will require a better understanding by the people of their environment, environmental problems and alternative solutions, and an acceptance of their responsibility in finding solutions to these problems.

In addition to utilizing the existing educational, technical, and financial assistance programs to reach this goal, the following objectives have been established:

1. To ensure the proper use and development of the land resource through land use policy formulation, land use planning, and adoption of needed incentive and regulatory measures by the appropriate unit of government.
2. To maintain a safe and plentiful supply of water for municipal, industrial, agricultural, and recreational uses through appropriate management, control, and utilization.
3. To provide the soil surveys and interpretations needed to guide the proper utilization of the soil, water, and related resources by private landowners and by units of government.
4. To improve the agricultural resource through proper agricultural land utilization, use of improved crops and livestock, and needed education programs.
5. To increase benefits from forest resources and insure an adequate supply of raw material for the forestry industries in the area through multiple-purpose management and utilization.
6. To develop the wildlife and sport-fishing resource in the area to provide recreation, income, and an esthetically pleasing environment.
7. To develop recreation facilities needed for the area's residents and promote the development of commercial recreation facilities and tourist accommodations.
8. To provide more jobs and adequate income by encouraging desirable industrial and economic development.
9. To increase income and promote utilization of the marine resources through pollution abatement, better fishery facilities, and proper management.
10. To seek the community facilities and services necessary for the health, education, welfare, and comfort of the area's residents.
11. To restore, protect, and preserve unique, irreplaceable, and non-renewable resources such as the tidal marsh, scenic vistas, and historical buildings and sites.
12. To cooperate and work closely with all existing planning organizations, agencies, and governing officials, and to help coordinate activities to ensure maximum effectiveness of all resource programs, funds, and technical assistance in solving the area's problems and in developing opportunities in the best interest of the area's people.



*Develop resources for generations which follow.*



The soil and water conservation districts have long had a specific interest in the prudent use, management, and protection of natural resources. The districts are engaged in programs to promote voluntary conformance with these principles by all land users within the project area, utilizing the assistance of many private, state, and federal agencies. Accelerated assistance from these sources will be required in order for the districts to fulfill their responsibility in accelerating various conservation programs.

A number of organizations at both the county and local levels are presently engaged in activities designed to achieve some type of resource conservation or development and have goals which duplicate or complement RC&D objectives. By virtue of having similar objectives, as well as having committee members and sponsors in common in many instances, these organizations are supported by and in turn support the RC&D project steering committees and executive board.

Project Operations--This plan of action will be implemented through a series of annual plans of work which will be developed by the county steering committees and the executive board in consultation with the project sponsors. The Guidelines For Development will be updated automatically each year in the course of preparing these plans, reflecting the changing conditions of the area and new opportunities and objectives of the local people.

The annual plan of work will enumerate the RC&D measures, measure sponsors, assisting agencies, time schedules, action programmed, and the amount and distribution of technical, financial, and other assistance required during the ensuing year. Planning assistance will be requested from the cooperating local, state, and federal agencies in preparing the plan of work to insure adequate funding and proper coordination of effort.

Proposed RC&D measures which have insufficient local support or those determined not feasible will be deleted and new proposals adopted and incorporated into the annual plan schedule. A revision of the Guidelines For Development will be required when sufficient alterations in project boundaries, conditions, or objectives occur to justify a major review.

The executive board has not attempted to establish permanent priorities for project operations or for RC&D measures beyond the first years of operation. The sponsors have placed highest priorities, during initial stages of operations, on measures relating to forestry, recreation and wildlife development, solid waste disposal, water management, land use planning, and agriculture.

Each county, in effect, is expected to establish its own priorities based on the amount of interest and funding which can be obtained by the county steering committee.

RC&D Measure Planning--A RC&D measure plan will be developed by the local sponsor of each adopted measure involving RC&D financial assistance. The project staff will provide leadership in securing technical assistance for project sponsors in preparing measure plans. These documents will provide supporting data, environmental statements, and give other available details including costs and benefits.

As an integral phase of planning RC&D measures involving construction or alterations of the land surface, appropriate investigations will be performed to determine the presence of historic and prehistoric sites. Alternate locations or layouts will be selected in order to preserve more significant historic sites. Where overriding public interest dictates the destruction of historic sites of lesser significance, the intrinsic scientific data will be salvaged by professional excavation.

A RC&D measure agreement based on the measure plan will be executed by the involved parties prior to measure implementation. Responsibilities for funding, land rights, contracting, construction, installation services, and other requirements are established in this formal document.



## Section IV

# THE PLAN OF ACTION

Project Opportunities--One of the important objectives of the project sponsors is to assist communities in securing facilities and services necessary for the health, education, welfare, and comfort of its residents.

The Coastal Area Planning and Development Commission can provide planning assistance to communities seeking financial grants and long-term loans. County RC&D steering committees and the executive board will have opportunities to guide groups and communities to this source of assistance in securing funding for needed facilities.

Local groups and county governments will have opportunities to request technical and financial assistance through existing cost-sharing programs for the installation of water management systems needed to improve living conditions.

The RC&D executive board can request assistance to examine the need for housing and assist the agencies involved in developing programs to provide adequate housing for area residents. Local contractors have an opportunity to expand their operations in low-cost housing and to develop innovative low-cost housing designs using local materials.

Implementation of the Rural Area Development Act or other state and federal programs may present opportunities for county governments in the RC&D project to request financial assist-

ance in installing adequate solid waste facilities, public buildings, and other needed public facilities.

The RC&D county steering committees and the executive board can support the expansion of vocational training programs for high school and adult classes. Special training programs can be created to prepare employees for both existing positions and for positions created by new industrial and commercial operations.

The RC&D executive board will have a good opportunity to secure assistance for local school boards to improve conservation and natural resource education throughout the school system.

The county RC&D steering committees and the executive board will have an opportunity to help small rural communities request assistance in establishing fire protection.

The county RC&D steering committees and the executive board can initiate and support efforts to improve medical care and facilities and ambulance service throughout the project area.

The county RC&D steering committees and the executive board will have opportunities to provide leadership in requesting and coordinating assistance from several sources to upgrade the overall recreation program in each county by developing and implementing county-wide recreation plans.

Recreation--Recreation facilities and programs for the resident population, as distinguished from tourist requirements, are an important amenity to total community living standards. The economic returns from public investments in recreation are difficult to measure, but local governments throughout the area are increasingly accepting recreational activities as another logical governmental responsibility.

County-wide recreation commissions supported by county governments are needed if the total community recreation needs are to be supplied.

Flood Control--Every community has flooding problems which limit community development, create health hazards, and otherwise reduce living standards. All local governments accept flood control as a basic community service, participating to the extent financing is available.

Additional technical and financial assistance is required in order to install public flood control systems.

Public Protection--The larger towns provide standard police and fire protection but must continue to upgrade their equipment and personnel. Rural police service is within the jurisdiction of the county sheriff departments. Several rural communities have developed rural fire defense units with assistance from the Georgia Forestry Commission. Additional units are needed for other small communities.

Public Buildings--Both the availability and the adequacy of county and city buildings vary throughout the area but are generally less than satisfactory. Office space and public meeting accommodations are badly needed in some counties and several towns.

Agency Assistance--The Coastal Area Planning and Development Commission is the primary source of planning assistance available to local units of government.

A number of federal and state agencies maintain local offices which administer a broad range of service programs, providing assistance to individuals and groups as well as units of government.

Credit and Financing--Commercial financial institutions have adequate lending capacity for ordinary trade and construction requirements. Installations of basic community facilities are seldom financially self-supporting; and, therefore, are not attractive investments for commercial lending firms without government participation in the form of grants and loan guarantees. Low-income families are frequently unable to secure commercial financing for homes and farm improvements. Farmers Home Administration, generally operating as a lender of last resort, provides credit for qualified applicants for farm operations, rural housing, community water and sewer systems, and other purposes.

If rural communities are to fill any important role in the future, a considerable increase in credit and financial assistance will be required in order to make the individual and community investments required to support a viable economy.



*Flood problems at Brunswick.*



*Liberty County health facility.*

Due to federal regulations and related increases in cost of operations, ambulance service is seldom available from private operators, resulting in an additional responsibility for local government. Several counties are participating in local and regional emergency ambulance programs in order to provide essential emergency service.

Water and Sewers--Adequate water and sewer facilities are prerequisites for acceptable living standards and for economic development. Water systems in several towns have been upgraded in recent years, but improvements are needed in other existing systems; and new systems are needed in many rural communities. Industrial sites in several instances have been developed outside existing utility systems, requiring expensive extension of utility lines and expansion of capacity.

Unfavorable soil conditions severely limit the availability of building sites which are suitable for operation of drain-field sewage systems, making public sewage systems essential for adequate waste treatment on these soils. Several communities do not have adequate treatment facilities for existing collector systems.

Greatly expanded programs of financial assistance will be necessary for rural communities to provide these basic services. County-wide water and sewer systems, operated as a function of county government, will usually be required to accomplish an acceptable level of coverage and service.

Housing--Numerous fine modern houses have been constructed throughout Coastal Georgia which provide attractive, comfortable, occasionally, luxurious accommodations for many families.



*More than one-half of houses in project area are inadequate.*

Unfortunately, too many houses classify on the other end of the scale. Due to the general shortage and resulting high cost of suitable land, poor families are seldom able to build on desirable lots. In 1971, 53 percent of the housing supply in the project area was structurally obsolete or inadequate.

Few building contractors are presently engaged in construction of speculative low-cost housing, although there is a definite need for this type of construction.

Public financial assistance in the form of loans, subsidies, or public housing is necessary if some poor families are to obtain adequate housing.

Solid Waste--Solid waste disposal has long been a seriously neglected problem in the project area. No community has adequately resolved the problem in terms of cost, health, or esthetics. County governments are being compelled to accept solid waste collection and disposal as an additional responsibility, for which they are generally inadequately prepared.

Financial assistance is essential if county commissions are to operate acceptable solid waste systems on an efficient county-wide or multi-county basis.

## COMMUNITY FACILITY AND SERVICES

Poor communities, like poor families, fall into a perpetual cycle from which escape is very difficult. Rural counties are often unable to afford the basic public services and community facilities which must be available before economic development--the one thing which would make these things economically feasible--can be expected to occur.

Therefore, virtually every community in Coastal Georgia is attempting to upgrade basic community services as rapidly as possible in order to compete for economic growth as well as to improve living conditions for present residents. Federal and state programs which provide financial grants and long-term loans to rural areas are essential for significant progress.

Education--One of the most serious problems confronting the area is a severe deficit of basic education. Table 10 presents some of the more interesting statistics concerning education in each county. More complete data are available in the appendix.

It would be a tragic mistake to underestimate the role that education plays in developing the resources of Coastal Georgia. High school consolidations have been accomplished in each county which permit a wider range of course offerings to more adequately meet the basic educational needs of each student. Continued emphasis on innovative teaching techniques will be required to eliminate the problem of dropouts.

Local libraries are served by regional libraries in Savannah, Statesboro, or Brunswick.

Considerable public support exists for upgrading and expanding both high school and adult vocational training programs. High school curriculum and instruction are being structured to better prepare more students for the positions which are expected to exist in industry, agriculture, and service trades.

The two-year Brunswick Junior College is the only fully accredited liberal arts college in the project area. The nearest four-year colleges are located in Savannah, Jacksonville, Statesboro, and Valdosta.

A vocation-technical school at Brunswick Junior College offers specialized training which is so essential in preparing employees for the more skilled jobs available in a modern technology. Several federal training and education programs, both within and outside the school system, are being used with varying degrees of success to develop latent skills.

Public Health--A general shortage of private and public health facilities and services exists in most of the area. Specialized public services for treatment of delinquency, alcoholism, mental retardation, and psychological and physical handicaps vary in availability and effectiveness. A serious shortage of comprehensive mental health services exists throughout the region.

Hospitals are located only in Glynn, Camden, and Liberty Counties. Many residents must, therefore, depend on medical services and facilities from outside the area. Small clinics opened during 1972 in Bryan and Long Counties and are projected to lead eventually to the establishment of general hospitals. The existing hospitals are constantly upgrading facilities and equipment in order to improve both the quality and scope of treatment supplied.

The shortage of medical personnel is a serious problem, particularly in the smaller communities. A total of 59 medical doctors and 18 dentists were engaged in active practice in the area in 1972.

Each county has a public health department which is operated under the supervision of the State Department of Human Resources and financed on a cooperative basis.

Table 10

### SCHOOL ATTENDANCE AND EXPENDITURES 1970-71

County	Avg. Daily Attendance	Teacher-Pupil Ratio	Graduates Dropouts		Expenditures Per ADA	Avg. Georgia Expenditure Per ADA	Avg. U. S. Expenditure Per ADA
Bryan	1,820	1:23.0	106	82	\$533	\$616	\$812
Camden	3,034	1:21.6	173	52	\$568	\$616	\$812
Glynn	11,488	1:21.6	749	287	\$632	\$616	\$812
Liberty	3,312	1:21.5	227	88	\$646	\$616	\$812
Long	869	1:19.2	64	26	\$733	\$616	\$812
McIntosh	1,867	1:20.5	76	62	\$603	\$616	\$812

Commuter Transportation-- Intercity bus service is available along the major highways to all of the larger towns on a generally infrequent schedule. Intracity commuter service is not available in any of the towns in the project area.

Air Travel-- Commercial air service is available only at Brunswick within the project area. Additional commercial facilities are available at Savannah and Jacksonville, which are frequently utilized by area residents.

Small public or private airports are located in four of the six counties. Military air installations are located at Glynnco Naval Air Station and Fort Stewart Military Reservation but are not available for civilian use.

Availability of private air service is a significant factor in attracting tourists to the Brunswick area, particularly to Jekyll and St. Simons Islands. Designers of tourist attractions in the future should not overlook this added attraction. Air transportation is not considered a severe limiting factor to area development, but air facilities in Long and Bryan Counties would be highly desirable.

Approximately 40,000 private planes pass over Coastal Georgia each year and could become a significant factor in economic development if proper facilities were developed for their use.

Land Freight Service--The rail system closely parallels the major highway routes, providing freight service to every town in the area. The pulp and paper industry furnishes the major market for rail freight service.

Motor freight service is also available to all towns, Brunswick having five trucking terminals. Major truck freight shipments to the interior have the same relationship to time-in-transit as does rail transport.

Water Freight Service--Brunswick is the only city in the project area having public port facilities adequate for handling general and bulk cargo. The federal installation, Kings Bay Terminal, in Camden County, has deep water capability and adequate facilities but is not presently available for full commercial development. Two of the major ports of the eastern seaboard are located at either end of the project area, at Savannah and Jacksonville, and offer serious competition for shipping business.

Water transport meshed with highway and rail networks provide an outlet for the area's natural resources and serve as a collector for materials needed for production within the area.

Project Opportunities--RC&D steering committees have a good opportunity to cooperate with the area news media to keep the public fully informed of project plans and progress.

The county RC&D steering committees can support efforts to improve public communications by securing additional public media outlets and improvements in commercial communication services.

The county RC&D steering committees and the executive board can support action to upgrade the highway system throughout the project area and to improve or provide road access to presently inaccessible areas.

The RC&D leadership can support and influence the installation of additional facilities at existing airports and construction of new airports where feasible. Similar opportunities will be available to maintain and upgrade other forms of commuter and freight service.

County RC&D steering committees have an opportunity to initiate or support efforts to properly maintain and upgrade water transport facilities.

## COMMUNICATION AND TRANSPORTATION

All Coastal Georgia counties except Bryan have adequate internal communications. Bryan County was severed by the formation of the Fort Stewart Military Reservation, creating communication and transportation problems between the two segments. Unfortunately, no one newspaper, radio, or television outlet covers the six-county area to the extent that a single message is likely to reach a sizable portion of the population. Only by direct mailing can a given audience be reached with certainty.

Telephone--Telephone service is available throughout the populated sections of the area. Five independent telephone companies serve the rural counties, and Southern Bell serves the Brunswick-Glynn County area. Direct distance dialing equipment is available in the larger exchanges.

Radio and Television--The project area supports four local radio stations, three located in Brunswick and one in Hinesville. Several stations in Savannah and Jacksonville effectively reach into the region with both radio and television programming. Cable television connections are available in the larger communities, permitting a wide choice of other stations. No commercial television stations are located in the project area, but the statewide education network does have an outlet in Bryan County.

Newspapers--The most commonly read newspapers are published in Brunswick, Savannah, and Jacksonville. Other newspaper service is provided by at least one local weekly in each of the six counties.

Transportation--Transportation facilities are considered generally adequate for existing needs. Weather conditions occasionally result in flood and fog problems which restrict traffic flow, but the mild climate eliminates other problems such as ice and snow accumulations.



*A major travel route nears completion.*

Highways--The highway network is composed of two parallel linear routes, U.S. 17 and Interstate 95, which transverse the project area and provide the only direct north-south passage. A large number of lateral highways connect with these routes to join the coast with the interior of Georgia.

When completed, I-95 will form a major travel corridor from the New England area to Georgia and Florida. The actual impact of this traffic is difficult to estimate, but retail sales are projected to increase 400 percent, and increased population growth and industrial activity are anticipated along the corridor.

As traffic volumes increase along all routes, the struggle to maintain and upgrade the highway system will become an ever more difficult and essential task. Good roads are an important factor in promoting tourism, but local access roads to many historical and recreational sites are presently inadequate.

Industrial Development--Industrial employment provides jobs for about 30 percent of the labor force. The primary industries are paper and paper products, seafood processing, chemical products, and lumber and other wood products. These industries are located in the area due primarily to the abundant timber and water resources combined with good transportation facilities.

All counties in the area are in a position to grow economically, the greatest need for accelerated growth being in the more rural counties. Industrial sites, a supply of labor, and development financing are available. Ample electric power for reasonable expansion is either available or can be provided at most locations. The natural gas distribution system is not as extensive, but service can be provided in larger towns.

The area's agricultural, timber, and marine resources will support further development of processing enterprises in addition to continued expansion of other industry and tourist accommodations.

The communities which most need industrial development often lack the basic community facilities and cultural and social amenities necessary to attract industrial management and their families.



*Wood-using industries are a major employer in the area.*

In recent years, there has been a concerted effort to encourage existing industrial concerns to expand and to secure new industry throughout the area. Approximately 20,000 acres of land have been designated as potential industrial sites in varying stages of development. The Coastal Area Planning and Development Commission provides primary planning assistance to local industrial development organizations in increasing industrial employment.

Environmental Problems--Due to the nature of the industry operating within the project, some inherent air and water quality problems have occurred, but considerable progress has been made in correcting these problems.

In addition to the other site controls which may be needed, there should be a general public policy that industrial development should be permitted only on suitable soils, or that inherent limitations will be corrected by the developer. Only a small percentage of the project area soils are suited for heavy building and traffic use, and problems having community implications can be predicted when development is permitted on unsuited soils without proper remedial measures.

Project Opportunities--One of the broad goals of the project sponsors is to provide more jobs and adequate income by encouraging desirable industrial and economic development. The RC&D steering committees, executive board, and project sponsors have an opportunity to assist the organizations presently engaged in industrial and economic development to fulfill their common objectives.

The RC&D project improves opportunities to assist in the formation of cooperative production, marketing, and processing organizations when needed for proper development of natural resources.

Industrial development commissions have opportunities in some project counties to promote development of mineral resources. State agencies and local soil and water conservation districts can provide technical assistance to miners to reclaim mined lands.

The RC&D executive board can request additional technical assistance to inventory and monitor natural resources required to promote new and improved methods of utilizing natural resources.

The RC&D executive board can request additional technical assistance to provide soil interpretations and conservation planning assistance on potential industrial, residential, and commercial sites.



## INDUSTRY AND BUSINESS

The total economic structure of Coastal Georgia has a broad base composed of manufacturing, construction, wholesale and retail trade, government, and services. Agriculture commands only a small percentage of this economic base, making the business and industrial segment of the economy of vital concern to rural residents as well as city dwellers.

Retail Trade--Local business activity directly reflects the level of employment and purchases by major employers. The trend in retail sales has been steadily upward, reaching \$125,951,000 in 1971.

Retailers in the smaller communities and in the old central business districts of larger towns have encountered critical problems in competing with newer and more convenient shopping centers. Every downtown district could perhaps benefit from complete renovation designed to meet the requirements of modern shoppers.

Considerable relocation of retail business can be expected as major tourist services shift from the older highways to I-95 and I-16.

Service Industry--New tourist services establishments along I-95 are expected to become a major source of additional retail sales and employment. New jobs for 500 people are anticipated in 1973 along the sections open for use, with additional increases expected each year until the total interstate system is completed. In 1971, the Jekyll Island State Park alone created a significant demand for tourist services for approximately 2,250,000 people who traveled within the project area to visit the park.

The growth rate in service trades has shown a steady increase for many years, making new records in number employed and total sales. Continued expansion is predicted in nearly all trades, re-emphasizing the importance of adequate vocational-technical training.

Agri-business activity, with the single exception of forest products, is almost nonexistent in the project area. Significant increases in agricultural enterprises would create a market for a broad range of agri-business services.

Government employment has an important economic impact in the counties around Fort Stewart in Hinesville, Glynnco Naval Air Station at Brunswick, and Kings Bay Terminal in Camden County.



*Fishing families need supplies.*



*Dune land on barrier island.*

routes. In order to maintain business activity for this sector of the economy, it is essential that attractions be developed which are of sufficient quality to attract the tourist from the interstate highway.

The older highways must be upgraded to permit safe and comfortable passage for sightseers. The general appearance of both town and country must be improved by litter removal and better building maintenance. Air pollution problems related to pulp and paper processing must likewise be solved if the visitor is to linger long in the area.

Our History--Coastal Georgia is rich in archeological and historical sites which exemplify the early history of America; many of these can be further developed as travel attractions without detrimental effects on the environment. These historical sites and buildings constitute one of the major potential tourist attractions. The City of St. Marys, Fort Frederica on St. Simons Island, Fort King George at Darien, Midway Church at Midway, and Fort McAllister near Richmond Hill are examples of interesting sites which are open for public enjoyment. Thirty-five sites having significant interest have been identified and should be preserved.

Nature Study--The coast of Georgia has a number of unusual land types, plant and animal species, and other natural phenomena--often overlooked as being attractions by local residents--which are of great interest to a significant segment of the tourist population and should be made available for study.

Wildlife refuges and nature areas of notable interest are: Harris Neck National Wildlife Refuge, St. Catherine's Island, Sapelo Island

Refuge, Wolf Island National Wildlife Refuge, Altamaha State Waterfowl Management Area, Blackbeard Island National Wildlife Refuge, Cumberland Island, Lewis Island, and the Marshes of Glynn.

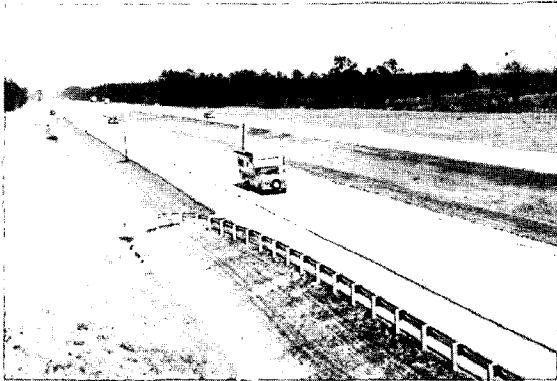
Project Opportunities--Many of the goals of the project sponsors in other areas of resource development will directly benefit the establishment of additional tourist services. Improvements which create a better place for living will also create a better place for visiting. Conversely, the development of tourist recreational facilities will also supply some of the recreational needs for area residents.

The Coastal Area Planning and Development Commission is presently engaged in tourism development in conjunction with local governments, Chambers of Commerce, and other interested groups. The RC&D executive board can provide all possible assistance to expedite the efforts of these organizations.

The RC&D steering committees and project sponsors will have an opportunity to participate in the acquisition, preservation, and exhibition of examples of unique natural areas and historical sites, both as local educational resources and as tourist attractions. Greater efforts can be made to upgrade roads and approaches to these sites and to improve the historical marker system on an area-wide basis. Installation of attractive welcome centers and bulletin boards with maps and descriptions of area attractions at interstate rest areas could promote interest in the area.

The RC&D executive board can support efforts of other groups to secure additional tourist accommodations and facilities.

## TOURISM



*Interstates bringing more tourists.*

The visitor to Coastal Georgia is interested primarily in enjoying the recreational activities, historical sites and structures, convention facilities, and the unique natural coastal environment. Georgia residents presently outnumber visitors from the other states by a ratio of ten to one as destination-point tourists.

Demand for tourist services in the project area is expected to double during the decade of the '70's. During the first year (1975) following completion, over 30 million people are expected to travel Interstates 16 and 95 in the project area, and a significant number of these travelers will be tourists. Merely providing lodging, gas, food, and other essential services for this volume of the motoring public will create new business activity at the major interchanges along these highways.

The greatest need, and the greatest opportunity, is for the development of attractions having adequate interest for the destination-point tourist. A wide range of tourist services offers perhaps more opportunity for increasing local employment than development of any other resource. Types of resource development activities that have potential for increasing the number of destination-point visitors are: fresh and saltwater fishing, hunting, historical research, camping, nature study, tennis, golfing, and increased public use of the off-shore islands.

Georgia Islands--The Golden Isles of the Georgia coast have long been a favorite playground for a few wealthy families. Only since 1954, when Jekyll Island was purchased by the State of Georgia and made into a state park, has a major beach in the project area been accessible to the general public. Following construction of recreation and convention facilities and motel accommodations, Jekyll Island has become the most popular destination point for tourists visiting the project area. Approx-

imately 2.2 million people visited in 1971, and completion of an ocean aquarium in 1973 is expected to increase the number of future visitors. About one million visitors were overnight guests on the island during 1972.

St. Simons Island has a limited amount of public beach and other recreation facilities but was developed primarily as a residential and resort area. Cumberland Island has been proposed as a National Seashore, and limited access will be provided by ferry for the general public. Approximately 10,000 visitors are expected on peak days during the summer season. The other major islands in the project area are either privately owned or have been committed to use as state and federal wildlife preserves. Therefore, these great resources are accessible only to the owners and to a few individuals and groups having special interests in wildlife preservation and marine research activities.

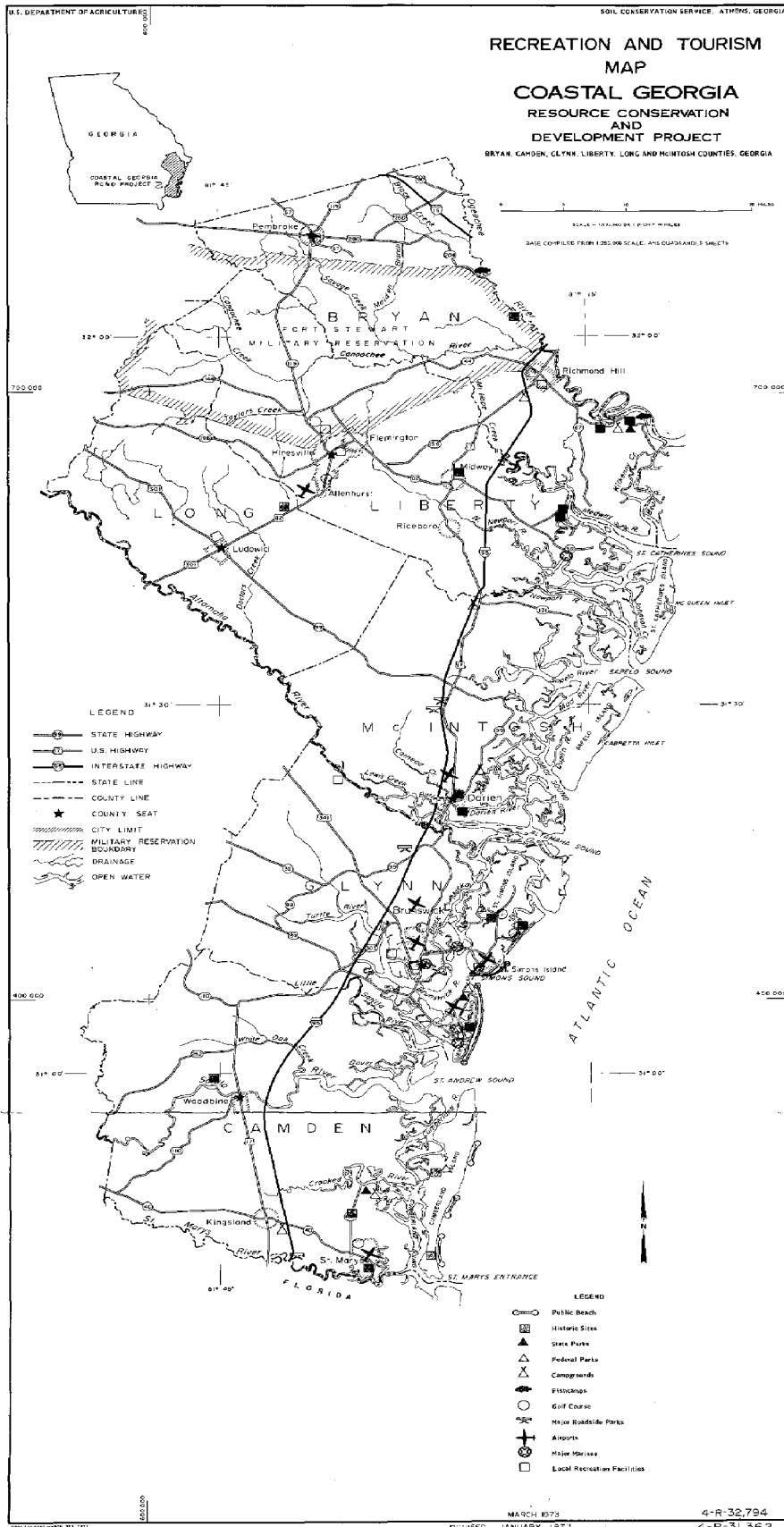
Mainland--The rural mainland attracts a limited number of destination-point tourists for wildlife-based recreational pursuits and the more passive sightseeing activities.

The coastal fishing villages are generally oriented toward permanent and seasonal residents and visiting fishermen. The weathered buildings, shrimp docks and nets, ancient oaks, marshes, and assorted boats combine to create an atmosphere found in few other locations. Unfortunately, few of these lovely villages are well attuned to the casual sightseeing tourist. Many state highways end short of coastal waters on private property, and the extensive display of posted signs makes it clear that adequate public access has not been provided.

Excessive development of tourist services would very likely alter the character of these villages to the point that their value to present property owners would be diminished. New locations should be selected where possible for major tourist facilities in order to retain the character of these picturesque communities.

Tourist Services--At least two major welcome centers which can serve as windows to the Georgia coast will be constructed along I-95 in the project area. Landowners within a short distance of the interstate interchanges will have an excellent opportunity to construct and operate major tourist service facilities. Those landowners farther away will have an improved potential for recreational developments which appeal to the tourist.

The completion of the interstate system will result in a major reduction of the traffic volume on U.S. 17 and other older highways. A corresponding reduction in business volume can be predicted for the establishments which have traditionally served the tourist along these



GL-5105 Glynn County Land Use Plan  
Purpose: To systematically update the land use plan and implementing regulations to adequately reflect changing conditions and guide community development.  
Sponsors: Glynn County Commission

GL-5106 Brunswick Land Use Plan  
Purpose: To systematically review and update the city land use plan and land use regulations which will encourage sound community development.  
Sponsors: City of Brunswick

LI-5107 Liberty County Land Use Plan  
Purpose: To develop an acceptable land use plan and implementing regulations which will protect the individual land owner and guide community development.  
Sponsors: Liberty County Commission

LO-5108 Long County Land Use Plan  
Purpose: To develop an acceptable land use plan and implementing regulations which will protect the individual land owner and guide community development.  
Sponsors: Long County Commission

MC-5109 McIntosh County Land Use Plan  
Purpose: To develop an acceptable land use plan and implementing regulations which will protect the individual land owner and guide community development.  
Sponsors: McIntosh County Commission

**Problem:** The economic importance of the forest resource should justify a continuing high priority on all phases of forestry research, forest management development, and public services needed by the industry in order to improve economic returns to land owners, processors, and the general economy of the area. Programs offering financial assistance are needed to encourage stand regeneration and other management practices by owners of small private forest tracts. Leadership by the RC&D forestry committee is needed in order for the RC&D leadership to initiate programs and support efforts of others to develop the forestry resource.

PA-5201 Hardwood Market Expansion  
Purpose: To develop additional markets for low-quality hardwood timber to improve markets and prices which will justify land owner investments required to improve and protect hardwood stands.  
Sponsors: RC&D Executive Board, RC&D Forestry Committee

PA-5202 Increase Equipment Availability for Woodland Treatment  
Purpose: To provide assistance to improve equipment scheduling and secure additional commitments of equipment from the appropriate sources to perform the site preparation and tree planting measures needed on private land.  
Sponsors: RC&D Executive Board, RC&D Forestry Committee

PA-5203 Increase Prescribed Burning  
Purpose: To secure additional equipment and operating personnel to accelerate controlled burning practices on pine forest

lands. Uncontrolled undergrowth and accumulated tree litter constitute a serious wildfire hazard to timber stands and reduce regeneration of desirable native wildlife food plants on forest land.  
Sponsors: RC&D Executive Board, RC&D Forestry Committee

PA-5204 Utilization of Wood Wastes  
Purpose: To expand research efforts and field studies directed toward economic recovery of wood volume presently lost in harvesting and processing operations.  
Sponsors: RC&D Executive Board, RC&D Forestry Committee

**Problem:** Many natural resources have not been fully utilized for the economic advantage of the area because of a wide range of limiting factors. Feasibility studies of production potential, producer arrangements, markets, or other aspects of individual or group development of a resource are necessary before a new commodity is produced. In many counties no comparable enterprises are in operation, making education and promotion essential for progress.

PA-5301 Agricultural Commodity Study  
Purpose: To initiate feasibility studies designed to identify agricultural potential and programs to implement production and marketing operations for agricultural commodities selected as having reasonable potential for profitable operations.  
Sponsors: RC&D Executive Board

BR-5302 Fishery Co-op Study  
Purpose: To secure assistance to prepare studies to determine the potential for cooperative purchasing and marketing by Bryan County commercial fishermen to improve purchasing and marketing efficiency.  
Sponsors: Bryan County RC&D Steering Committee

CA-5303 Blueberry Production and Marketing  
Purpose: To assist in organizing blueberry production and marketing arrangements.  
Sponsors: Camden County RC&D Steering Committee

LI-5304 Fishery Co-op Study  
Purpose: To secure assistance to prepare studies to determine the potential for cooperative purchasing and marketing by Liberty County commercial fishermen to improve purchasing and marketing efficiency.  
Sponsors: Liberty County RC&D Steering Committee

LI-5305 Truck and Specialty Crop Study  
Purpose: To prepare a feasibility study on organizing cooperative truck and specialty crop enterprises in Liberty County.  
Sponsors: Liberty County RC&D Steering Committee

LO-5306 Development of Ludowici Clay Resource  
Purpose: To seek markets and a manufacturer to utilize the clay deposits once used to make Ludowici clay roof tiles.  
Sponsors: Long County RC&D Steering Committee

MG-5307 Fishery Co-op Study

Purpose: To secure assistance to prepare studies to determine the potential for cooperative purchasing and marketing by McIntosh County commercial fishermen.

Sponsors: McIntosh County RC&D Steering Committee

Problem: The freshwater streams and the tidal waters of the project area constitute great resources, but boat launching and other supporting facilities are inadequate to provide services needed to develop the sport fishing economic potential.

PA-5401 Development of Marine Sport Fishing

Purpose: To support efforts to improve the marine sport fishing resource by improvements in shore facilities and services and the creation of artificial reefs in off-shore waters.

Sponsors: RC&D Executive Board

BR-5402 Boat Launching Facilities

Purpose: To support state programs to secure sites and to construct additional boat launching facilities to provide access to the recreation waters of Bryan County.

Sponsors: Bryan County Commission

CA-5403 Boat Launching Facilities

Purpose: To support state programs to secure sites and to construct additional boat launching facilities to provide access to the recreation waters of Camden County.

Sponsors: Camden County Commission

GL-5404 Boat Launching Facilities

Purpose: To support state programs to secure sites and to construct additional boat launching facilities to provide access to the recreation waters of Glynn County.

Sponsors: Glynn County Commission

LI-5405 Boat Launching Facilities

Purpose: To support state programs to secure sites and to construct additional boat launching facilities to provide access to the recreation waters of Liberty County.

Sponsors: Liberty County Commission

LO-5406 Boat Launching Facilities

Purpose: To support state programs to secure sites and to construct additional boat launching facilities to provide access to the recreation waters of Long County.

Sponsors: Long County Commission

MC-5407 Boat Launching Facilities

Purpose: To support state programs to secure sites and to construct additional boat launching facilities to provide access to the recreation waters of McIntosh County.

Sponsors: McIntosh County Commission

Problem: The marine resource is very valuable to the area economy and should be further developed where possible. Oyster production has declined from 6 million pounds to 140,000 pounds per year in recent decades due to pollution contamination and

other problems. Many oyster bottoms could now be used, but producers have not resumed operations.

PA-5501 Marine Resource Development

Purpose: To support the improved utilization of the marine resource through marshland protection, fishery exploration, marine research of natural production potentials, and research in perfecting mariculture techniques.

Sponsors: RC&D Executive Board

GL-5502 Oyster Bottom Reseeding

Purpose: To secure technical and financial assistance to reseed unpolluted oyster bottoms for controlled harvest by the general public.

Sponsors: Glynn County RC&D Steering Committee

Problem: The development and utilization of the game-wildlife resource is severely hampered by a lack of public understanding of game management potential and the importance of game regulations. Increased technical assistance to individual land owners and education of the general public is needed in order to develop game-wildlife potential. Continuing improvements are needed on public hunting areas to provide for anticipated increases in hunting pressure. Programs providing financial incentives for wildlife habitat enhancement are needed to accelerate development of private wildlife lands.

PA-5601 Wildlife Management Programs

Purpose: To support state and federal programs to develop the game-wildlife resource. Additional technical and financial assistance are needed by both private land owners and public game management areas. The RC&D wildlife committee will provide leadership in securing the assistance needed.

Sponsors: RC&D Executive Board, RC&D Wildlife Committee

PA-5602 Wildlife Regulations Education

Purpose: To initiate or support programs which convince the hunter, the courts, and the general public that adherence and enforcement of game laws is essential to wildlife resource development.

Sponsors: RC&D Executive Board, RC&D Wildlife Committee

Problem: The wildlife resource is an important factor in recreation and tourism developments, but reliable data are not available on many important aspects of this resource. Further study and inventories of wildlife populations, wildlife habitat, and land use relationships are badly needed. The executive board will need the assistance of the appropriate agencies to consider specific RC&D measures designed to improve knowledge of area wildlife resources.

PA-5701 Wildlife Wetland Study

Purpose: To obtain technical assistance to complete and publish a wildlife wetland study of each county by an interagency team of specialists.

Sponsors: RC&D Executive Board

PA-5702 Stream Classification Study

Purpose: To obtain technical assistance to prepare and publish a stream classification study in each county by an interagency and interdisciplinary team of specialists.  
Sponsors: RC&D Executive Board

PA-5703 Monitor Wildlife Populations and Habitat

Purpose: To establish an interagency program for monitoring wildlife populations and habitat relationships in order to properly manage the resource.  
Sponsors: RC&D Executive Board

Problem: Excess surface water accumulations, stream overflow, and high seasonal water tables create economic and social problems in many locations. Most of the existing water management systems have been installed without regard for the entire hydrologic unit, sometimes resulting in inefficient installation and operation. Detailed evaluations of existing problems and the identification of alternative solutions are needed in order for county and community governments to reach decisions and establish priorities. The executive board will consider requests for additional RC&D flood prevention measures on the basis of these local priorities.

BR-5801 Hydrologic Study of Bryan County

Purpose: To complete a study of water management problems and alternative solutions.

Sponsors: Bryan County Commission

CA-5802 Hydrologic Study of Camden County

Purpose: To complete a study of water management problems and alternative solutions.

Sponsors: Camden County Commission

CA-5803 Water Management Plan

Purpose: To provide technical assistance to prepare a master water management plan for the City of Kingsland in Camden County.  
Sponsors: City of Kingsland

LI-5804 Hydrologic Study of Liberty County

Purpose: To complete a study of water management problems and alternative solutions.

Sponsors: Liberty County Commission

LO-5805 Hydrologic Study of Long County

Purpose: To complete a study of water management problems and alternative solutions.

Sponsors: Long County Commission

Problem: Many towns and rural communities do not have ample neighborhood parks, trails, picnic facilities, playing fields, and other land-based recreation facilities. Technical assistance is needed to appraise recreation needs and to prepare a comprehensive plan and program for county and/or town governments. Financial assistance is required to implement adequate recreation programs and provide needed facilities.

PA-5901 Study of Recreation Potential of Borrow Pits

Purpose: To determine the potential of borrow pits along I-95 for development as water-based recreation sites.

Sponsors: RC&D Executive Board, County RC&D Steering Committees

BR-5902 Bryan County Recreation Plan

Purpose: To support a comprehensive study of the recreation facilities and needs required to develop an overall recreation plan for Bryan County.

Sponsors: Bryan County RC&D Steering Committee

BR-5903 Black Creek Recreation Area

Purpose: To seek technical and financial assistance to develop the Black Creek community recreation area in Bryan County.

Sponsors: Bryan County RC&D Steering Committee

CA-5904 Camden County Recreation Plan

Purpose: To support a comprehensive study of the recreation facilities and needs required to develop an overall recreation plan for Camden County

Sponsors: Camden County RC&D Steering Committee

GL-5905 Brunswick Bicycle Trail

Purpose: To support and assist the City of Brunswick in developing a bike trail system connecting schools and parks.

Sponsors: City of Brunswick

GL-5906 Blythe Island Park

Purpose: To support efforts to develop Blythe Island in Glynn County as a state park best utilizing the land and water resources for public recreation.

Sponsors: Glynn County RC&D Steering Committee

LI-5907 Liberty County Recreation Plan

Purpose: To support a comprehensive study of the recreation facilities and needs required to develop an overall recreation plan for Liberty County.

Sponsors: Liberty County RC&D Steering Committee

LO-5908 Long County Recreation Plan

Purpose: To support a comprehensive study of the recreation facilities and needs required to develop an overall recreation plan for Long County.

Sponsors: Long County RC&D Steering Committee

MC-5909 McIntosh County Recreation Plan

Purpose: To support a comprehensive study of the recreation facilities and needs required to develop an overall recreation plan for McIntosh County.

Sponsors: McIntosh County RC&D Steering Committee

Problem: Many areas have great value for the propagation of certain wildlife species because of location, water, soils, vegetation, or other natural characteristics. In many instances, public acquisition is neither possible nor desirable.

PA-6001 Incentive Programs for Wildlife Habitat Preservation

Purpose: Support programs which provide financial incentives to private land owners who provide needed protection and preservation of areas having high public wildlife values.

Sponsors: RC&D Executive Board

Problem: The area has a number of significant historical, archeological, and natural areas which have not been adequately preserved or developed for convenient study or for tourism potential. Many sites of general interest are either not accessible or existing access routes are not adequate. Additional roads and road improvements are needed to develop these resources.

PA-7101 Preservation of Historic and Natural Sites

Purpose: To support local groups in their efforts to preserve significant examples of unique historic and natural sites.  
Sponsors: RC&D Executive Board

PA-7102 Highway System Improvement

Purpose: To support efforts by other groups to expand and upgrade the highway system throughout the project area and particularly to provide adequate access to tourist attractions.  
Sponsors: RC&D Executive Board

CA-7103 Cumberland Island Access

Purpose: To support efforts to provide convenient access to Cumberland Island, preferably by roadway.  
Sponsors: Camden County Commission

LI-7104 Development of Fort Morris

Purpose: To support programs to properly develop the Fort Morris historic site near Sunbury in Liberty County.  
Sponsors: Liberty County Commission

Problem: Industrial and commercial development is essential to continued development of area resources, and coordinated efforts can be effective in increasing industrial and commercial employment and business activity.

PA-7201 Industrial and Commercial Development

Purpose: To support and assist local and area development authorities secure desirable industrial and commercial expansion.  
Sponsors: RC&D Executive Board

BR-7202 Industrial Park Utilities

Purpose: To seek financial assistance to develop roads, water and sewer systems on industrial parks in the county.  
Sponsors: Bryan Industrial Authority

GL-7203 Industrial Park Development

Purpose: To support the transfer of Blythe Island land to the appropriate industrial development agency if the land is not utilized as a state park before it is needed for industrial expansion.  
Sponsors: Glynn County Commission

LI-7204 Hinesville Industrial Park Development

Purpose: To support efforts to acquire and develop an industrial park in Hinesville to improve prospects of industrial expansion.  
Sponsors: Liberty County RC&D Steering Committee

Problem: Private water supplies from shallow wells are generally ample, but they are particularly subject to pollution contamination in many sections due to surface water accumulations and high ground water tables. High cost of deep-well installations precludes their use by many families. Public water systems provide the most practical solution for towns as well as rural communities. County water systems are often the only practical method to serve small rural communities along densely populated roads, and community systems are necessary for isolated communities where county systems would not be practical.

BR-7301 Richmond Hill Water System

Purpose: To secure technical and financial assistance to increase capacity and extend service to meet projected population requirements.  
Sponsors: City of Richmond Hill

CA-7302 St. Marys Water System

Purpose: To upgrade city water service for projected requirements.  
Sponsors: City of St. Marys

CA-7303 Woodbine Water System

Purpose: To extend water service and expand capacity to meet projected needs.  
Sponsors: City of Woodbine

GL-7304 Extend Water Service in Glynn County

Purpose: To provide water service to populated areas not presently served by existing systems.  
Sponsors: Glynn County Commission

LI-7305 Riceboro Water System

Purpose: To provide public water service adequate for present and projected requirements.  
Sponsors: City of Riceboro

LI-7306 Midway Water System

Purpose: To install a public water system adequate to serve the residents of this small rural community.  
Sponsors: City of Midway

LI-7307 Rural Community Water Systems

Purpose: To organize residents of small communities and assist them in filing necessary applications for funding the installations of community water systems.  
Sponsors: Liberty County RC&D Steering Committee

MC-7308 Darien Water System

Purpose: To install a public water system adequate to serve projected requirements.  
Sponsors: City of Darien

MC-7309 Rural Community Water Systems

Purpose: To organize residents of small communities and assist them in preparing necessary applications for extension of existing water systems or installation of community systems.  
Sponsors: McIntosh County RC&D Steering Committee



Problem: Excess water problems and soil characteristics of much of the project area limit the successful utilization of private sewer installations, resulting in serious health hazards, degrading living conditions, and retarding orderly development. Substantial financial assistance is necessary to permit installation of community or county systems to serve rural communities which do not presently have sewer service.

PA-7401 Improved Assistance Programs

Purpose: To support expansion and improvements in existing programs, specifically by establishing the unique and critical nature of the soil conditions of the area as a basis for providing increased amounts of assistance to towns and rural communities for improving and extending public sewer service.

Sponsors: RC&D Executive Board

BR-7402 Richmond Hill Sewer System

Purpose: To install public sewage disposal system in Richmond Hill adequate for projected population.

Sponsors: City of Richmond Hill

CA-7403 St. Marys Sewer System

Purpose: To provide sewer service for the urban areas of St. Marys.

Sponsors: City of St. Marys

CA-7404 Kingsland Sewer System

Purpose: To extend and upgrade public sewer system to provide adequate service.

Sponsors: City of Kingsland

CA-7405 Woodbine Sewer System

Purpose: To install sewer collectors and treatment facilities for City of Woodbine.

Sponsors: City of Woodbine

GL-7406 Glynn County Sewer System

Purpose: To install public sewage disposal systems for populated areas of Glynn County outside present service areas.

Sponsors: Glynn County RC&D Steering Committee

LI-7407 Liberty County Sewer System

Purpose: To install public sewage disposal systems for populated areas of Liberty County outside present service areas.

Sponsors: Liberty County RC&D Steering Committee

LI-7408 Hinesville Sewer System Extension

Purpose: To extend sewer collectors to the remaining sections of the city and to provide additional treatment capacity when required.

Sponsors: City of Hinesville

LO-7409 Ludowici Sewer System Improvement

Purpose: To install waste treatment facilities and to extend collector lines into sections of city not presently served.

Sponsors: City of Ludowici

MC-7410 Darien Sewer System

Purpose: To install sewer collectors and treatment facilities adequate for the City of Darien.

Sponsors: City of Darien

MC-7411 McIntosh County Sewer System

Purpose: To install public sewage disposal systems for populated areas of McIntosh County outside Darien service areas.

Sponsors: McIntosh County RC&D Steering Committee

Problem: Excess surface water produced by stream overflow and precipitation create severe problems for property owners, local governments, and a majority of area residents. Local people have opportunities to seek technical and financial assistance to install flood prevention projects through the Small Watershed Act and the U.S. Corps of Engineers Authorities.

GL-7501 Installation of Planned Watershed Measures

Purpose: To accelerate implementation of the Turtle River Watershed to reduce flood damage and improve living conditions as provided in the approved watershed work plan.

Sponsors: Glynn County Commission, Turtle River Watershed Association

Problem: Low levels of educational achievement and vocational training reduce personal employment throughout the area. Resource conservation education is not presently sufficiently emphasized in the school curriculum. Improvements are needed in academic, vocational, and resource education in most schools in the project area in order to adequately develop the people resource.

BR-7601 School System Improvement

Purpose: To support studies and appropriate action to upgrade vocational training and school facilities throughout the school system.

Sponsors: Bryan County RC&D Steering Committee

GL-7602 Resource Conservation Education Development

Purpose: To support county school boards in expanding natural resource education through a student environmental symposium program.

Sponsors: Glynn County RC&D Steering Committee

Problem: Many families throughout the project area live in substandard housing because they cannot afford or cannot locate adequate homes. Excess water problems limit the amount of residential land available, contributing to high costs for desirable land. In addition to assistance programs for water and sewer systems, special assistance in the form of grants, loans, and public housing is necessary.

PA-7701 Rural Housing Assistance

Purpose: To support measures to accelerate assistance to residents of rural communities, including low income families, for improving existing housing and for new construction.

Sponsors: RC&D Executive Board

PA-7702 Housing Design

Purpose: To support programs to develop innovative designs and construction methods utilizing locally produced building materials where possible.

Sponsors: RC&D Executive Board

BR-7703 Pembroke Public Housing

Purpose: To support Public Housing Authority in expanding public housing to meet most critical needs.

Sponsors: City of Pembroke

Problem: Shortages of medical personnel and inadequate facilities are problems in rural counties, resulting in either inadequate medical care or the inconvenience of traveling some distance to obtain treatment.

PA-7801 Improved Health Care

Purpose: To support efforts to upgrade area health care services, hospital facilities, and emergency ambulance services.

Sponsors: RC&D Executive Board

BR-7802 Bryan County Hospital

Purpose: To improve local health services delivery by the construction and operation of a modern hospital.

Sponsors: Bryan County RC&D Steering Committee

CA-7803 Emergency Ambulance Service

Purpose: To support and assist in efforts to secure adequate emergency service for Camden County.

Sponsors: Camden County Commission

LO-7804 Long County Hospital

Purpose: To improve local health services delivery by the construction and operation of a modern hospital.

Sponsors: Long County RC&D Steering Committee

MC-7805 McIntosh Health Services and Facilities

Purpose: To initiate and support efforts to secure resident medical personnel and provide health service facilities including a local clinic and nursing home.

Sponsors: McIntosh County RC&D Steering Committee

Problem: City and county office buildings in some locations are not adequate for efficient government operations or to accommodate public meetings. Low taxbases, indebtedness, and current expenditures for essential services make local financing difficult in these locations.

PA-7901 Public Building Construction

Purpose: To support local efforts and provide authorized assistance for construction of adequate city and county buildings throughout the project area.

Sponsors: RC&D Executive Board

LO-7902 Ludowici City Hall Construction

Purpose: To support efforts to obtain financial assistance to construct a new city hall for the City of Ludowici.

Sponsors: Long County RC&D Steering Committee

Problem: Many reaches of roadside and sections of towns in the project area are littered, buildings dilapidated, or otherwise detract from the natural beauty of the area.

PA-8001 Community Beautification Projects

Purpose: To support efforts by local governments and civic groups who attempt to remove litter, make floral plantings, conduct beautification projects, or improve community appearance in other ways.

Sponsors: RC&D Executive Board

Problem: Highways and railroads provide vital transportation services which must be maintained. Timely completion of the interstate highway system and construction and improvements on other highways are critical problems of local residents.

PA-8101 Area Highway Improvements

Purpose: To support construction, renovation, and maintenance of all classes of highways necessary for efficient traffic flows.

Sponsors: RC&D Executive Board

Problem: Water transport is an important factor in the area economy. Maintenance and improvements on existing navigation channels and dock facilities and installation of additional improvements as needed are essential to economic progress.

GL-8201 Improve Headquarters for Brunswick Port Authority

Purpose: To support efforts to locate suitable relocation site and construct suitable headquarters buildings and facilities for the Brunswick Port Authority.

Sponsors: Glynn County RC&D Steering Committee

MC-8202 Improve McIntosh Navigation Channels

Purpose: To support efforts to improve essential navigation channels in McIntosh County to permit unimpeded movement of commercial fishing boats from home docks to fishing grounds.

Sponsors: McIntosh County RC&D Steering Committee

Problem: Airports and facilities for servicing aircraft are important to industrial growth and other forms of economic development. Adequate facilities are not available in several locations and constitute handicaps to community development. Assistance programs and local efforts are needed to construct, upgrade, and maintain airports and equipment servicing capability.

CA-8301 St. Marys Airport Improvements

Purpose: To secure new runway lighting system and renovation needed to provide adequate airport for City of St. Marys.

Sponsors: City of St. Marys

CA-8302 Woodbine Airport Construction

Purpose: To secure a site and construct an airport adequate for the Woodbine area of Camden County.

Sponsors: Camden County Commission, City of Woodbine

Problem: Inadequate collection and disposal facilities for solid waste results in indiscriminate dumping of trash throughout the project area, creating public health hazards and degrading esthetic values. County-wide or multi-county systems are needed for adequate and economical service. Technical assistance is needed to develop acceptable plans, and financial assistance through the Rural Development Act or other sources is needed to implement plans.

BR-8401 Solid Waste Treatment Facilities  
Purpose: To complete the necessary studies to determine the most practical system, suitable landfill sites, and methods of financing; and seek cost sharing support from appropriate sources to implement an acceptable collector and disposal system.  
Sponsors: Bryan County Commission

CA-8402 Solid Waste Treatment System  
Purpose: To complete the necessary studies to determine the most practical system, suitable landfill sites, and methods of financing; and seek cost sharing support from appropriate sources to implement an acceptable collector and disposal system.  
Sponsors: Camden County Commission

GL-8403 Solid Waste Treatment System  
Purpose: To complete the necessary studies to determine the most practical system, suitable landfill sites, and methods of financing; and obtain cost-sharing assistance from appropriate sources to implement an acceptable collector and disposal system.  
Sponsors: Glynn County Commission

LI-8404 Solid Waste Treatment System  
Purpose: To complete the necessary studies to determine the most practical system, suitable landfill sites, and methods of financing; and obtain cost sharing assistance from appropriate sources to implement an acceptable collector and disposal system.  
Sponsors: Liberty County Commission

LO-8405 Solid Waste Treatment System  
Purpose: To complete the necessary studies to determine the most practical system, suitable landfill sites, and methods of financing; and obtain cost sharing assistance from appropriate sources to implement an acceptable collector and disposal system.

Sponsors: Long County Commission

MC-8406 Solid Waste Treatment System  
Purpose: To complete the necessary studies to determine the most practical system, suitable landfill sites, and methods of financing; and obtain cost sharing assistance from appropriate sources to implement an acceptable collector and disposal system.

Sponsors: McIntosh County Commission

Problem: Many small towns and rural communities do not have adequate fire protection, resulting in high insurance costs, high property losses, and retarded community development. Rural fire defense units will be secured to provide adequate fire fighting equipment to communities which demonstrate sufficient concern to provide volunteer fire departments to maintain and operate the equipment.

LI-8501 Riceboro Fire Defense Unit  
Purpose: To organize and equip a volunteer fire department to provide improved fire protection.

Sponsors: City of Riceboro, Liberty County Commission, Georgia Forestry Commission

LI-8502 Walthourville Fire Defense Unit  
Purpose: To organize and equip a volunteer fire department to provide improved fire protection.

Sponsors: Liberty County Commission, Georgia Forestry Commission

LI-8503 Colonels Island Fire Defense Unit  
Purpose: To organize and equip a volunteer fire department to provide improved fire protection.

Sponsors: Liberty County Commission, Georgia Forestry Commission

## SHORT TERM PLAN

As emphasized throughout the Guidelines For Development, Coastal Georgia RC&D Project objectives can be achieved only through the concerted efforts of local people. Many local, state, and federal agencies can provide assistance, but ultimately progress will occur only when the collective leadership of a community shares these objectives and seeks their implementation.

In most instances the RC&D measures included in the Short Term Plan are those which require funding commitments by the U. S. Department of Agriculture or other governmental agencies. Many activities by other groups and agencies make notable contributions to resource development without direct technical or financial assistance. The RC&D leadership supports and will assist these activities as a means of meeting project objectives.

A number of factors, including local interest, project feasibility, funding opportunities, and personnel availability, can be anticipated to influence priorities and progress. The RC&D Steering Committees and RC&D Executive Board

will periodically review the RC&D measure priorities established in the Short Term Plan and recommend adjustments to the sponsors which may be indicated.

The following tables list RC&D measure proposals which have been given high priorities and which RC&D project sponsors propose to undertake during each of the first three years of project operations.

Projected costs are based on the limited information available and are subject to adjustment as a result of further feasibility studies and detailed designs. RC&D measure plans and RC&D measure agreements will establish accurate cost estimates and funding distribution in the course of implementing each RC&D measure requiring RC&D funds during project operations.

The project staff and cooperating agencies will assist the sponsors in preparing environmental statements for each RC&D measure considered to be a major federal action or to have a significant impact on the environment.

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RC&D Measure	Action Planned	Sources of Assistance	Local	State	RC&D	Other Federal
PA-1101 Interstate Impact Planning	Accelerate planning in areas influenced by interstate interchanges.	Soil Conservation Service (SCS)			5,000	
PA-1102 Public Land Use Planning Assistance	Accelerate assistance to public land use planning agencies.	SCS			5,000	
PA-1103 RC&D Measure Planning Assistance	Accelerate planning assistance to prepare RC&D measure plans.	SCS			5,000	
PA-1104 Aerial Photography	Secure more recent photography for planning purposes.	SCS			1,500	

RC&D Measure	Action Planned	Sources of Assistance	Local	State	RC&D	Other Federal
PA-1105 Base Maps	Develop family of county base maps for resource planning.	Coastal Area Planning & Development Commission (CAPDC) SCS	5,000		5,000	
GL-1107 Urban Impact Planning	Accelerate planning assistance to Brunswick urban area.	SCS			1,500	
PA-1201 Interstate Impact Application	Accelerate application assistance in interchange impact areas.	SCS			2,000	10,000
PA-1202 Critical Area Inventory	Inventory critical areas which create public damages.	SCS			3,000	
BR-1203 Roadbank Stabilization	Establish vegetation on eroding roadbanks in Bryan County.	State Department of Transportation (DOT) Bryan County SCS	2,500	4,000	6,000	
GL-1204 Urban Impact Application	Accelerate application assistance in Brunswick problem area.	SCS			1,500	
PA-1301 Accelerated Forest Management Planning	Accelerate planning assistance to private forest owners.	Georgia Forestry Commission (GFC) U.S. Forest Service (USFS) SCS		5,000	5,000	
PA-1302 Accelerated Assistance to Wood Processors	Accelerate technical assistance to wood processors.	SCS GFC USFS		5,000	5,000	
PA-1401 Forest Land Treatment	Accelerate assistance to implement forest management plans.	GFC SCS		5,000	5,000	50,000
PA-1501 Highway Impact Soil Survey	Accelerate preparation of soils information in problem areas.	SCS			2,000	
PA-1502 Public Land Use Soil Interpretations	Accelerate preparation of special soils interpretations for local governments.	SCS			5,000	
GL-1504 Interim Soil Interpretation Report	Prepare interim soils information for Glynn County.	SCS			5,000	
PA-1601 Accelerated Wildlife Planning	Accelerate wildlife planning assistance to land owners.	State Department of Natural Resources (DNR) SCS		15,000	7,000	
PA-1701 Accelerated Wildlife Application	Accelerate assistance to implement planned wildlife measures.	DNR SCS		15,000	7,000	25,000
BR-3301 Pembroke Area Flood Prevention	Complete feasibility studies, designs, and environmental statements and begin installation.	Bryan County SCS	10,000		55,000	
CA-3302 Hi Hat Community Flood Prevention	Complete feasibility study, designs, and environmental statements and begin installation.	Camden County SCS	7,500		53,000	

RC&D Measure	Action Planned	Sources of Assistance	Local	State	RC&D	Other Federal
GL-3303 Sterling Community Flood Prevention	Complete feasibility study, designs, and environmental statements and begin installation.	Glynn County SCS	25,000		53,000	
LI-3304 Gum Branch Community Flood Prevention	Complete feasibility study, designs, and environmental statements and begin installation.	Liberty County SCS	25,000		105,000	
MC-3306 Ridgeville Area Flood Prevention	Complete feasibility study, designs, and environmental statements and begin installation.	McIntosh County SCS	11,000		33,000	
BR-5101 Bryan County Land Use Plan	Prepare basic soils and land resource data.	County Government CAPDC SCS	10,000		5,000	
BR-5103 Richmond Hill Land Use Plan	Complete and adopt municipal land use plan.	City Government CAPDC	5,000		1,000	
CA-5104 Camden County Land Use Plan	Adopt and implement county land use plan.	County Government CAPDC	10,000			
GL-5105 Glynn County Land Use Plan	Prepare basic soils and land use data.	County Government CAPDC SCS	10,000		5,000	
GL-5106 Brunswick Land Use Plan	Prepare basic soils and land use data.	City Government CAPDC SCS	10,000		5,000	
LI-5107 Liberty County Land Use Plan	Assist county planning commission complete and implement land use plan.	County Government CAPDC SCS	10,000		5,000	
BR-5302 Fishery Co-op Study	Feasibility study of potential for cooperative purchasing and marketing.	University of Georgia (U.Ga.) INR CAPDC	5,000	5,000		10,000
LO-5306 Development of Ludowici Clay	To develop products and markets to use resource.	Georgia Tech. CAPDC	5,000	15,000		
MC-5307 Fishery Co-op Study	Feasibility study of potential for cooperative purchasing and marketing.	U.Ga. INR CAPDC	5,000	5,000		10,000
CA-5403 Boat Launching Facilities	Secure sites and construct ramps and related facilities.	Camden County INR	3,500	3,500		
PA-5701 Wildlife Wetland Study	Publish county maps delineating and describing wildlife wetlands.	INR Bureau of Sport Fisheries and Wildlife (BSFW)	5,000	5,000	5,000	5,000
BR-5801 Hydrologic Study of Bryan County	Study of water management problems and alternate solutions.	Bryan County SCS U.S. Army, Corps of Engineers(ACE)	8,000			30,000
CA-5802 Hydrologic Study of Camden County	Study of water management problems and alternate solutions.	Camden County SCS ACE	5,000			25,000
LI-5804 Hydrologic Study of Liberty County	Study of water management problems and alternate solutions.	Liberty County SCS ACE	8,000			30,000

RC&D Measure	Action Planned	Sources of Assistance	Local	State	RC&D	Other Federal
LO-5805 Hydrologic Study of Long County	Study of water management problems and alternate solutions.	Long County SCS ACE	5,000			25,000
PA-5901 Borrow Pit Study	Feasibility study of large borrow pits for water-based recreation facilities.	SCS CAPDC DNR	2,000	5,000	5,000	
BR-5902 Bryan County Recreation Plan	Prepare comprehensive evaluation of recreation facilities and needs.	CAPDC Georgia Recreation Commission (GRC) SCS	5,000	5,000	1,000	
CA-5904 Camden County Recreation Plan	Prepare comprehensive evaluation of recreation facilities and needs.	CAPDC GRC SCS	5,000	5,000	1,000	
LI-5907 Liberty County Recreation Plan	Prepare comprehensive evaluation of recreation facilities and needs.	CAPDC GRC SCS	5,000	5,000	1,000	
LO-5908 Long County Recreation Plan	Prepare comprehensive evaluation of recreation facilities and needs.	CAPDC GRC SCS	5,000	5,000	1,000	
MC-5909 McIntosh County Recreation Plan	Prepare comprehensive evaluation of recreation facilities and needs.	CAPDC GRC SCS	5,000	5,000	1,000	
LI-7204 Hinesville Industrial Park Development	Acquire site and install basic facilities.	Hinesville Industrial Authority CAPDC	100,000			100,000
BR-7301 Richmond Hill Water System	Extend and upgrade city water system.	CAPDC Farmers Home Administration (FHA) Economic Development Administration (EDA)	230,000*			222,600
CA-7303 Woodbine Water System	Extend and upgrade city water system.	CAPDC FHA EDA Environmental Protection Agency (EPA)	125,000*			125,000
CA-7405 Woodbine Sewer System	Construct collector and treatment facilities.	CAPDC EDA FHA EPA	420,000*			430,000
GL-7501 Turtle River Watershed (FL-566)	Install planned flood prevention structures.	Glynn County SCS	75,000			200,000
PA-7701 Rural Housing Assistance	Upgrade rural housing.	FHA	500,000*			50,000
BR-8401 Solid Waste Treatment Facilities	Prepare acceptable plans and evaluate sites.	CAPDC Cooperative Extension Service (CES) SCS	2,000	2,000	500	
CA-8402 Solid Waste Treatment Facilities	Prepare acceptable plans and evaluate sites.	CAPDC CES SCS	2,000	2,000	500	
GL-8403 Solid Waste Treatment Facilities	Prepare acceptable plans and evaluate sites.	CAPDC CES SCS	2,000	2,000	500	

RC&D Measure	Action Planned	Sources of Assistance	Local	State	RC&D	Other Federal
LI-8404 Solid Waste Treatment Facilities	Prepare acceptable plans and evaluate sites.	CAPDC CES SCS	2,000	2,000	500	
MC-8406 Solid Waste Treatment Facilities	Prepare acceptable plans and evaluate sites.	CAPDC CES SCS	2,000	2,000	500	
LI-8501 Fire Defense Unit	Equip volunteer fire department at Riceboro.	Liberty County Commission (LCC) GFC	2,000	2,000		4,000
LI-8502 Fire Defense Unit	Equip volunteer fire department at Walthourville.	LCC GFC	2,000	2,000		4,000
LI-8503 Fire Defense Unit	Equip volunteer fire department at Colonels Island.	LCC GFC	2,000	2,000		4,000

\* Includes FHA loans



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RC&D Measure	Action Planned	Sources of Assistance	Local	State	RC&D	Other Federal
PA-1101 Interstate Impact Planning	Accelerate planning in areas influenced by interstate interchanges.	Soil Conservation Service (SCS)			8,000	
PA-1102 Public Land Use Planning Assistance	Accelerate assistance to public land use planning agencies.	SCS			5,000	
PA-1103 RC&D Measure Planning Assistance	Accelerate planning assistance to prepare RC&D measure plans.	SCS			8,000	
GL-1107 Urban Impact Planning	Accelerate planning assistance to Brunswick urban area.	SCS			4,000	
PA-1201 Interstate Impact Application	Accelerate application assistance in interchange impact areas.	SCS			8,000	50,000
GL-1204 Urban Impact Application	Accelerate application assistance in Brunswick problem area.	SCS			2,000	
GL-1205 Roadbank Stabilization	Secure assistance to treat eroding roadbanks in Glynn County.	Glynn County State Department of Transportation(DOT) SCS	2,000	10,000	15,000	
PA-1301 Accelerated Forest Management Planning	Accelerate planning assistance to private forest owners.	Georgia Forestry Commission (GFC) U.S. Forest Service (USFS) SCS		5,000	10,000	5,000
PA-1302 Accelerated Assistance to Wood Processors	Accelerate technical assistance to wood processors.	GFC USFS SCS		5,000	5,000	
PA-1401 Forest Land Treatment	Accelerate assistance to implement forest management plans.	GFC USFS SCS		5,000	5,000	100,000
PA-1501 Highway Impact Soil Survey	Accelerate preparation of soils information in problem areas.	SCS			5,000	
PA-1502 Public Land Use Soil Interpretation	Accelerate preparation of special soils interpretations for local governments.	SCS			2,500	
CA-1503 Interim Soil Survey Report	Accelerate preparation of soils information in Camden County.	SCS			5,000	
PA-1601 Accelerated Wildlife Planning	Accelerate wildlife planning assistance to land owners.	State Department of Natural Resources (DNR) SCS		15,000	8,000	
PA-1701 Accelerated Wildlife Application	Accelerate assistance to implement planned wildlife measures.	DNR SCS		15,000	8,000	100,000
PA-1801 Accelerated Education and Information Program	Addition of area communications and information specialist.	Cooperative Extension Service (CES)		7,500	7,500	7,000

RC&D Measure	Action Planned	Sources of Assistance	Local	State	RC&D	Other Federal
PA-3101 Fishing Structure Study	Feasibility studies of existing structures and other potential sites.	DOT DNR SCS	5,000	10,000	10,000	
PA-3102 Study of Canoe Trails	Prepare feasibility studies of potential sites.	Coastal Area Planning & Development Commission (CAPDC) DNR Bureau of Outdoor Recreation (BOR)	5,000	10,000	10,000	10,000
BR-3103 Recreation Park Facilities	Initiate feasibility studies and secure site commitment.	Bryan County CAPDC DNR SCS	5,000	5,000	3,200	5,000
CA-3104 Recreation Park Facilities	Initiate feasibility studies and secure site commitment.	Camden County CAPDC DNR SCS	5,000	5,000	5,000	5,000
GL-3105 Recreation Park Facilities	Determine feasibility, prepare plans, secure land, and upgrade Altamaha park facilities.	Glynn County CAPDC DNR SCS	5,000		5,000	5,000
LI-3106 Recreation Park Facilities	Initiate feasibility studies and secure site commitment.	Liberty County CAPDC DNR SCS	5,000	5,000	5,000	5,000
BR-3301 Pembroke Flood Prevention	Complete construction.	Bryan County SCS	(Full estimate included in FY 1974)			
CA-3302 Hi Hat Community Flood Prevention	Complete construction.	Camden County SCS	(Full estimate included in FY 1974)			
GL-3303 Sterling Community Flood Prevention	Complete construction.	Glynn County SCS	(Full estimate included in FY 1974)			
LI-3304 Gum Branch Community Flood Prevention	Complete construction.	Liberty County SCS	(Full estimate included in FY 1974)			
LO-3305 City of Ludowici Flood Prevention	Complete feasibility study, designs, and environmental statements and begin installation.	Long County SCS	55,000		16,000	
MC-3306 Ridgeland Area Flood Prevention	Complete construction.	McIntosh County SCS	(Full estimate included in FY 1974)			
BR-3401 Seven-Mile Bend Bluff Erosion Treatment	Stabilize two sections of eroding streambanks.	SCS Bryan County U.S. Army Corps of Engineers (ACE)	5,000		50,000	10,000
BR-5101 Bryan County Land Use Plan	Assist county planning commission complete and implement plan.	CAPDC SCS	7,500		1,000	
BR-5102 Pembroke Land Use Plan	Prepare basic soils and land resource data.	CAPDC SCS	5,000		1,000	
GL-5105 Glynn County Land Use Plan	Assist county planning commission complete and implement plan.	CAPDC SCS	15,000		2,500	

RC&D Measure	Action Planned	Sources of Assistance	Local	State	RC&D	Other Federal
GL-5106 Brunswick Land Use Plan	Assist city planning commission complete and implement plan.	CAPDC SCS	7,500		1,000	
MC-5109 McIntosh County Land Use Plan	Prepare basic soils and land use data.	CAPDC SCS	5,000		10,000	
PA-5201 Hardwood Market Expansion	Studies to develop products and processes to utilize low-quality wood.	GFC University of Georgia (U.Ga.) USFS		5,000		5,000
PA-5202 Equipment for Woodland Treatment	Develop and implement plan to increase equipment availability.	GFC		5,000	5,000	
PA-5203 Increase Prescribed Burning	Obtain equipment and personnel needed to accelerate practice on pine forest land.	GFC	5,000	10,000		10,000
PA-5204 Use of Wood Wastes	Research and field studies to recover wasted wood.	CAPDC GFC U.Ga. USFS		5,000	5,000	5,000
PA-5301 Agricultural Commodity Study	Feasibility studies of potential products.	CAPDC U.Ga.	5,000	5,000		5,000
CA-5303 Blueberry Production and Marketing	Assistance in organizing producers and marketing.	CAPDC CES	5,000	5,000		10,000
LI-5304 Fishery Co-op Study	Feasibility study of potential for cooperative purchasing-marketing.	U.Ga. DNR CAPDC	5,000	5,000		10,000
PA-5401 Marine Sport Fishing	Creation of artificial reefs.	DNR		20,000		
PA-5702 Stream Classification Study	Prepare descriptions and classifications of area streams.	DNR Bureau of Sport Fisheries and Wildlife (BSFW) SCS		10,000	10,000	10,000
PA-5703 Monitor Wildlife Populations and Habitat	Develop and implement an area plan for monitoring wildlife conditions.	DNR BSFW SCS		5,000	5,000	5,000
BR-5903 Black Creek Recreation Area	Develop rural community recreation park.	Bryan County CAPDC	10,000			10,000
GL-5905 Brunswick Bicycle Trail	Restrict and improve existing trafficways to form connecting routes.	City Government CAPDC BOR	10,000			10,000
CA-7302 St. Marys Water System	Improvement and expansion of city water system.	CAPDC Farmers Home Administration (FHA) Economic Development Administration (EDA)	350,000*			340,000
CA-7403 St. Marys Sewer System	Install public collector and treatment facilities.	FHA CAPDC EDA	750,000*			650,000

RC&D Measure	Action Planned	Sources of Assistance	Local	State	RC&D	Other Federal
GL-7501 Turtle River Watershed(PL-566)	Install planned flood prevention structure.	Glynn County SCS	25,000			200,000
GL-7602 Resource Conservation Education Development	Develop environmental symposium in Glynn County high schools.	County School Board DNR SCS	5,000	5,000	1,000	
PA-7701 Rural Housing Assistance	Upgrade rural housing	FHA	500,000*			50,000
BR-8401 Solid Waste Treatment Facilities	Implement waste disposal plans.	Bryan County CAPDC	100,000			
CA-8402 Solid Waste Treatment Facilities	Implement waste disposal plans.	Camden County CAPDC	175,000			
GL-8403 Solid Waste Treatment Facilities	Implement waste disposal plans.	Glynn County CAPDC	250,000			
LI-8404 Solid Waste Treatment Facilities	Implement waste disposal plans.	Liberty County CAPDC	150,000			
LO-8405 Solid Waste Treatment Facilities	Prepare acceptable plans and evaluate sites.	Long County CAPDC CES SCS	125,000	2,000	500	
MC-8406 Solid Waste Treatment Facilities	Implement waste disposal plans.	McIntosh County CAPDC	125,000			

\* Includes FHA loans

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RC&D Measure	Action Planned	Sources of Assistance	Local	State	RC&D	Other Federal
PA-1101 Interstate Impact Planning	Accelerate planning in areas influenced by interstate interchanges.	Soil Conservation Service (SCS)			15,000	
PA-1102 Public Land Use Planning Assistance	Accelerate assistance to public land use planning agencies.	SCS			2,000	
PA-1103 RC&D Measure Planning Assistance	Accelerate planning assistance to prepare RC&D measure plans.	SCS			12,000	
GL-1107 Urban Impact Planning	Accelerate planning assistance to Brunswick urban area.	SCS			4,000	
PA-1201 Interstate Impact Application	Accelerate application assistance in interchange impact areas.	SCS			14,000	50,000
GL-1204 Urban Impact Application	Accelerate application assistance in Brunswick problem area.	SCS			4,500	
PA-1301 Accelerated Forest Management Planning	Accelerate planning assistance to private forest owners.	Georgia Forestry Commission (GFC) U. S. Forest Service (USFS) SCS		5,000	10,000	5,000
PA-1302 Accelerated Assistance to Wood Processors	Accelerate technical assistance to wood processors.	GFC USFS SCS		5,000	5,000	
PA-1401 Forest Land Treatment	Accelerate assistance to implement forest management plans.	GFC USFS SCS		10,000	10,000	150,000
PA-1501 Highway Impact Soil Survey	Accelerate preparation of soils information in critical problem areas.	SCS			7,000	
LI-1505 Interim Soil Survey Report	Prepare interim soils information for Liberty County.	SCS			5,000	
PA-1601 Accelerated Wildlife Planning	Accelerate wildlife planning assistance to land owners.	State Department of Natural Resources (DNR) SCS		15,000	9,000	
PA-1701 Accelerated Wildlife Application	Accelerated assistance to implement planned wildlife measures.	DNR SCS		15,000	9,000	100,000
PA-1801 Accelerated Education and Information Program	Addition of area communications and information specialist.	Cooperative Extension Service (CES) SCS		7,500	7,500	7,500
BR-3103 Recreation Park Facilities	Prepare and implement development plans.	Bryan County Coastal Area Planning and Development Commission (CAPDC) DNR SCS	50,000		50,000	25,000
CA-3104 Recreation Park Facilities	Prepare and implement development plans.	Camden County CAPDC DNR SCS	50,000		50,000	25,000

RC&D Measure	Action Planned	Sources of Assistance	Local	State	RC&D	Other Federal
GL-3105 Recreation Park Facilities	Prepare and implement development plans.	Glynn County CAPDC DNR SCS	50,000		50,000	25,000
LI-3106 Recreation Park Facilities	Prepare and implement development plans.	Liberty County CAPDC DNR SCS	50,000		50,000	50,000
MC-3108 Recreation Park Facilities	Initiate site feasibility studies and secure site commitment.	McIntosh County CAPDC DNR SCS	5,000	5,000	5,000	5,000
LI-3201 Wildlife Development	Obtain site and install water control structures and other facilities.	Liberty County CAPDC DNR SCS	50,000		50,000	25,000
IO-3305 City of Ludowici Flood Prevention	Complete construction.	Long County SCS	(Full estimate included in FY 1975)			
BR-5102 Pembroke Land Use Plan	Assist city planning commission complete and implement plan.	CAPDC SCS	2,500		1,000	
MC-5109 McIntosh County Land Use Plan	Assist county planning commission complete and implement plan.	CAPDC SCS	7,500		2,000	
PA-5201 Hardwood Market Expansion	Studies to develop products and processes to utilize low-quality wood.	GFC University of Georgia (U.Ga.) USFS		2,000	2,000	5,000
PA-5202 Equipment for Woodland Treatment	Develop and implement plan to increase equipment availability.	GFC		2,000	2,000	
PA-5203 Increase Prescribed Burning	Obtain equipment and personnel needed to accelerate practice on pine forest land.	GFC	5,000	10,000		10,000
PA-5204 Use of Wood Wastes	Research and field studies to recover wasted wood.	GFC U.Ga. USFS		2,000	3,000	5,000
PA-5301 Agricultural Commodity Study	Feasibility studies of potential products.	CAPDC U.Ga.	5,000	5,000		10,000
BR-5402 Boat Launching Facilities	Secure sites and construct ramps and related facilities.	Bryan County DNR	3,500	3,500		
GL-5404 Boat Launching Facilities	Secure sites and construct ramps and related facilities.	Glynn County DNR	3,500	3,500		
LI-5405 Boat Launching Facilities	Secure sites and construct ramps and related facilities.	Liberty County DNR	3,500	3,500		
LO-5406 Boat Launching Facilities	Secure sites and construct ramps and related facilities.	Long County DNR	3,500	3,500		
MC-5407 Boat Launching Facilities	Secure sites and construct ramps and related facilities.	McIntosh County DNR	3,500	3,500		

RC&D Measure	Action Planned	Sources of Assistance	Local	State	RC&D	Other Federal
PA-5703 Wildlife Population and Habitat Study	Develop and implement an area plan for monitoring wildlife conditions.	INR Bureau of Sport Fisheries and Wildlife (BSFW) SCS		10,000	10,000	10,000
CA-5803 Water Management Plan	Study of water management problems and alternate solutions for City of Kingsland.	Camden County SCS U.S. Army Corps of Engineers (ACE)	5,000		10,000	10,000
BR-7402 Richmond Hill Sewer System	Install collector and treatment system.	Farmers Home Administration (FHA) Environmental Protection Agency (EPA)	500,000*			500,000
GL-7501 Turtle River Watershed (PL-566)	Install planned flood prevention structure.	Glynn County SCS	30,000			300,000
PA-7701 Rural Housing Assistance	Upgrade rural housing.	FHA	500,000*			45,000
CA-8301 Airport Improvements	Upgrade runways and supporting facilities at St. Marys.	CAPDC Federal Aviation Agency	5,000			50,000

\* Includes FHA loans

# SFONSORS APPROVAL

We the legal sponsors of the Coastal Georgia Resource Conservation and Development Project do hereby adopt these Guidelines For Development and by the affixed signatures submit this plan for review and authorization for operations.

BOARD OF COUNTY COMMISSIONERS  
BRYAN COUNTY, GEORGIA

By Jonnie Hearn  
Title Chairman  
Date June 5, 1973

This action authorized at an official meeting of the Bryan County Commissioners.

On April 3, 1973  
At Pembroke, Georgia  
Attest Eugene Mock  
Title Clerk

BOARD OF COUNTY COMMISSIONERS  
LIBERTY COUNTY, GEORGIA

By Gene E. Bryant  
Title Chairman  
Date May 18, 1973

This action authorized at an official meeting of the Liberty County Commissioners.

On April 3, 1973  
At Hinesville, Georgia  
Attest Carol R. Logan  
Title Clerk

COASTAL AREA PLANNING AND  
DEVELOPMENT COMMISSION

By Doris E. Flythe  
Title Chairman  
Date June 13, 1973

This action authorized at an official meeting of the Coastal Area Planning and Development Commission.

On May 9, 1973  
At Darien, Georgia  
Attest John P. Haddock  
Title Secretary

BOARD OF COUNTY COMMISSIONERS  
CAMDEN COUNTY, GEORGIA

By James M. Hagan  
Title Chairman  
Date May 30, 1973

This action authorized at an official meeting of the Camden County Commissioners.

On March 20, 1973  
At Woodbine, Ga.  
Attest J. G. Gentry  
Title Clerk

BOARD OF COUNTY COMMISSIONERS  
LONG COUNTY, GEORGIA

By James A. Black  
Title Chairman  
Date June 8, 1973

This action authorized at an official meeting of the Long County Commissioners.

On June 7, 1973  
At Ludowici, Georgia  
Attest Mrs. June Gordon  
Title Clerk

COASTAL SOIL AND WATER CONSERVATION  
DISTRICT

By George C. Martin  
Title Chairman  
Date June 5, 1973

This action authorized at an official meeting of the Coastal Soil and Water Conservation District

On May 2, 1973  
At Midway, Georgia  
Attest H. H. Parker  
Title Secretary

BOARD OF COUNTY COMMISSIONERS  
GLYNN COUNTY, GEORGIA

By John E. Taylor  
Title Chairman  
Date July 25, 1973

This action authorized at an official meeting of the Glynn County Commissioners.

On June 21, 1973  
At Brunswick, Georgia  
Attest H. H. B. B.  
Title Clerk

BOARD OF COUNTY COMMISSIONERS  
MCINTOSH COUNTY, GEORGIA

By Lloyd Thompson  
Title Chairman  
Date July 20, 1973

This action authorized at an official meeting of the McIntosh County Commissioners.

On June 15, 1973  
At Darien, Georgia  
Attest Mrs. P. P. P.  
Title Clerk

SATILLA RIVER SOIL AND WATER  
CONSERVATION DISTRICT

By Marion H. Haddock  
Title Chairman  
Date April 25, 1973

This action authorized at an official meeting of the Satilla River Soil and Water Conservation District.

On March 30, 1973  
At Waycross, Georgia  
Attest Alvin J. Mink  
Title Secretary

The program conducted will be in compliance with all requirements respecting nondiscrimination as contained in the Civil Rights Act of 1964 and the Regulations of the Secretary of Agriculture (7 C.F.R. Sec. 15.1-15.12) which provides that no person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any activity receiving Federal financial assistance.





## Section VI

# APPENDIX

## APPROXIMATE ACREAGE AND MAJOR LAND USE DISTRIBUTIONS

	<u>Bryan</u>	<u>Camden</u>	<u>Glynn</u>	<u>Liberty</u>	<u>Long</u>	<u>McIntosh</u>	<u>Project</u>
*Total Surface Area	291,200	444,800	297,600	343,000	257,900	306,600	1,941,100
**Total Water Area	12,800	32,000	37,900	19,100	1,200	42,600	145,600
**Total Land Area	278,400	412,800	259,700	323,900	256,700	264,000	1,795,500
**Total Non-Tidal Land Area	252,200	292,525	176,065	281,640	256,700	166,835	1,425,965
**Salt Marsh	20,495	78,275	74,235	39,760	---	77,485	290,250
**Fresh Marsh	2,020	21,000	4,700	1,500	---	5,650	34,870
**Tidal Swamp	3,685	21,000	4,700	1,500	---	14,030	44,415
**Incorporated Areas	4,177	8,006	16,896	14,989	1,785	1,430	47,283
**Off-shore Islands 1/	---	16,700	21,690	7,200	---	14,800	60,390
**Federal & State-Owned Land	75,500	44,200	14,750	112,600	27,500	44,800	319,350
**Forest 2/	228,550	297,190	157,620	243,050	236,535	179,415	1,342,360
**Cropland	12,100	1,500	1,700	9,000	8,500	1,800	34,600
**Pastureland	3,400	700	4,800	3,700	2,600	4,300	19,500

1/ Excludes marshland

\* Coastal Area Planning and Development Commission

2/ Includes forest on public lands

\*\* Soil Conservation Service 1972

\*\*\* Conservation Needs Inventory 1967

Appendix Table 2

## POPULATION DATA 1970

	<u>Bryan</u>	<u>Camden</u>	<u>Glynn</u>	<u>Liberty</u>	<u>Long</u>	<u>McIntosh</u>	<u>Project</u>
Total Population	6,539	11,334	50,528	17,569	3,746	7,371	97,087
% Change 1960-70	+5	+13.6	+20.4	+21.3	-3.3	+15.8	+17.2
Urban		3,408	33,498	8,582			45,488
Towns 1000-2500	1,361	2,833			1,419	1,826	7,439
Rural	5,178	5,093	17,030	8,987	2,327	5,545	44,160
Non-white	1,797	4,113	12,712	6,164	1,193	3,694	29,673
White	4,742	7,221	37,816	11,405	2,553	3,677	67,414
Age under 6 yrs.	819	1,443	5,660	2,319	411	920	11,572
Age 6-18	1,959	3,503	13,768	4,242	1,155	2,352	26,979
Age 19-44	1,733	3,707	18,049	8,148	1,057	2,088	34,782
Age 45-64	1,259	1,989	9,357	2,060	739	1,367	16,771
Age 65 & over	499	692	3,694	800	384	644	6,663

Source: Bureau of Census

Appendix Table 3

## POPULATION OF COUNTY SUBDIVISIONS

	<u>1970</u>	<u>1960</u>	<u>% Change</u>
Bryan County			
Pembroke	1,361	1,450	-6.1
Richmond Hill	826		
Camden County			
Kingsland	1,831	1,536	19.2
St. Marys	3,408	3,272	4.2
Woodbine	1,002	845	18.6
Glynn County			
Brunswick	19,585	21,703	-9.8
Dock Junction (U)	6,009	5,417	10.9
Glynco (U)	2,558		
St. Simons (U)	5,346	3,199	67.1
Liberty County			
Allenhurst	230		
Flemington	265	149	77.9
Fort Stewart (U)	2,448*		
Hinesville	6,134*	3,174	93.3
Midway	167	240	-30.4
Riceboro	252	259	-2.7
Long County			
Ludowici	1,419	1,578	-10.1
McIntosh County			
Darien	1,826	1,569	16.4

(U) - Unincorporated

Source: Bureau of Census

\* Special census, April 1970

Appendix Table 4

TOTAL INCOME WITH PERSONAL INCOME PERCENTAGE  
DISTRIBUTION BY MAJOR SOURCES 1969

	<u>Bryan</u>	<u>Camden</u>	<u>Glynn</u>	<u>Liberty</u>	<u>Long</u>	<u>McIntosh</u>
Total (dollars)	9,800,000	29,800,000	149,000,000	44,900,000	5,800,000	12,400,000
<u>Percentage Distribution</u>						
Farm Earnings	5.4	1.2	.4	.8	10.3	-.6
Federal-Civilian	5.2	1.7	5.2	17.9	4.4	4.4
Military	1.9	.5	10.2	39.0	2.0	1.7
State & Local	22.0	7.1	5.9	2.2	35.0	17.1
Manufacturing	10.5	---	26.8	10.1	5.9	17.5
Construction	3.5	2.4	5.6	1.1	---	---
Trans., Comm., & Utilities	3.8	3.6	2.7	4.6	---	2.6
Trade	9.8	---	12.1	5.0	5.5	9.4
Fin., Ins. & Real Estate	.8	---	3.0	.7	.2	---
Services	6.0	5.0	12.3	4.0	4.7	9.2

Division of Research, College of Business Administration, The University of Georgia.

Appendix Table 5

OCCUPATION BY NUMBER AND COUNTY 1970

	<u>Bryan</u>	<u>Camden</u>	<u>Glynn</u>	<u>Liberty</u>	<u>Long</u>	<u>McIntosh</u>	<u>Project</u>
Professionals	201	406	2,204	396	120	214	3,541
Managers & Administrators	164	249	1,520	344	69	206	2,612
Sales Workers	116	178	1,287	196	93	47	1,917
Clerical & Kindred Workers	202	453	2,568	621	79	208	4,131
Craftsmen, Foremen & Kindred Workers	388	678	2,698	502	156	304	4,726
Operatives, Non- transport	418	1,053	2,473	410	154	692	5,200
Transport Equip- ment Operatives	131	138	617	165	68	115	1,234
Laborers	165	436	1,185	226	98	296	2,406
Farmers & Farm Employees	121	106	84	242	104	27	684
Service Workers	130	386	2,535	442	113	225	3,831
Private Household Workers	53	123	670	226	32	29	1,133
No. Employed Out- side County of Residence	914	610	828	166	573	693	3,784

Source: Bureau of Census

Appendix Table 6

## SCHOOL ATTENDANCE AND EXPENDITURES 1970-71

	<u>Bryan</u>	<u>Camden</u>	<u>Glynn</u>	<u>Liberty</u>	<u>Long</u>	<u>McIntosh</u>
Enrolled Grades 1-7	1,456	2,148	8,025	2,291	586	1,494
Enrolled Grades 8-12	767	1,289	5,148	1,579	409	689
Enrolled Exceptional	8	102	344	67	34	120
Enrolled Kindergarten	0	0	0	0	0	0
Avg. Daily Attendance	1,820	3,034	11,488	3,312	869	1,867
Pupils Per Teacher	1:23.0	1:21.6	1:21.6	1:21.5	1:19.2	1:20.5
U.S. Average	1:22.3	1:22.3	1:22.3	1:22.3	1:22.3	1:22.3
Dollars Per ADA	533	568	632	646	733	603
Georgia Average	616	616	616	616	616	616
U.S. Average	812	812	812	812	812	812
Percent Local Funds	13.6	34.0	37.5	13.1	25.1	12.7
Percent State Funds	68.7	57.0	51.5	60.3	52.1	70.5
Percent Federal Funds	17.7	9.0	11.0	26.6	22.8	16.8
Dropouts - Boys	55	30	161	53	16	28
Dropouts - Girls	27	22	126	35	10	34
Graduates - Boys	43	87	386	100	35	31
Graduates - Girls	63	86	363	127	29	45
Entering College	6	51	305	76	10	18
Entering Tech-Voc	7	31	39	45	8	5

Source: State and County Department of Education

Appendix Table 7

## WATER AND SEWER INVENTORY 1972

	<u>Wells (No.)</u>	<u>Capacity GPD</u>	<u>Demand GPD</u>	<u>Public Sewers</u>
Bryan County				
Pembroke	2	7,000,000	300,000	yes
Richmond Hill	4	100,000	40,000	no
Camden County				
Kingsland	1	700,000	200,000	yes
St. Marys	2	2,160,000	850,000	no
Woodbine	1	900,000	650,000	no
Glynn County				
Brunswick	5	4,200,000	3,000,000	yes
St. Simons	3	2,000,000	500,000	yes
Liberty County				
Hinesville	3	2,160,000	400,000	yes
Allenhurst				no
Flemington				no
Midway				no
Riceboro	1	700,000	*	no
Long County				
Ludowici	2	19,500	19,000	yes**
McIntosh County				
Darlen	3	1,787,600	557,000	no

\* No distribution

\*\* No treatment

Source: Coastal Area Planning and Development Commission

## SUPPLEMENTAL WILDLIFE WETLANDS HABITAT DATA

Introduction

When attempting to describe wetland, it should be apparent that the definition of wetland varies according to intended use. Wildlife wetland is considered to be land that is flooded either by stream flow or by surface water accumulations for significant periods of time and provides acceptable habitat for wildlife. Some of the other land not considered wetland from a wildlife point of view may have a water table close enough to the surface to affect other uses such as cropland, pasture, woodland, or homesites and would be considered wetland for these uses.

Descriptions of wetland types used depict landscape characteristics, water relationships, and vegetation and do not take into consideration alterations made by man. The dominant vegetation which occurs on each type is listed to give some indication of the available wildlife food sources.

Wetland Wildlife Land Types

## I. Tidal Wetland

Land flooded by both salt and fresh water due to tidal action. There are three general types, each having distinctive vegetative cover.

## A. Salt Marsh

The first type, located nearest the ocean, is salty tidal marsh. Vegetation is chiefly smooth cordgrass Spartina alterniflora and and needle rush Juncus roemerianus. Other plants, including salt bermuda Distachlis spicata, glassworts Salicornia spp., marshhay cordgrass Spartina patens, sea ox-eye Borreria frutescens, high tide bush Iva frutescens, and marsh elder Baccharis spp., are also found in smaller quantities.

## B. Fresh Marsh

Brackish or fresh water marsh is located to the west toward the inland streams. Vegetation here is chiefly big cordgrass Spartina cynosuroides, cattails Typha spp., pickerelweed Pontederia spp., widgeongrass Ruppia maritima, bulrush Scirpus spp., spikerushes Eleocharis spp., smartweed Polygonum spp., paspalums Paspalum spp., panicums Panicum spp., and buttonbush Cephalanthus occidentalis. Within the two land types above occur hammocks and islands whose vegetation varies from scrubs to both soft and hardwood trees.

## C. Tidal Swamp

The third type of tidal wetland is the tidal swamp. This waterlogged land type is flooded frequently. The vegetation is hardwood, chiefly tupelo Nyssa aquatica, blackgum Nyssa sylvatica, Ogeechee lime Nyssa ogeche, cypress Taxodium distichum, ash Fraxinus pennsylvanica, sweetgum Liquidambar styraciflua, and red maple Acer rubrum. Located within the area are hammocks covered by laurel oak Quercus laurifolia, water oak Quercus nigra, swamp chestnut oak Quercus michauxii, and sycamore Platanus occidentalis.

## II. Inland Wetland Group

Very poorly and poorly drained wetland in flood plains, basins, and flats.

## A. Flood Plains

This land type consists of the perennial and intermittent stream valleys that make up the natural drainage system of the area. Streams that originate within the area have shallow, ill-defined stream channels and the entire valley is flooded during periods of above normal stream flow. The larger creeks and rivers have well-defined stream channels and established flood plains.

The vegetation is chiefly blackgum Nyssa sylvatica, cypress Taxodium distichum, tupelo Nyssa aquatica, red maple Acer rubrum, ash Fraxinus pennsylvanica, sweetgum Liquidambar styraciflua, water oak Quercus nigra, swamp chestnut oak Quercus michauxii, cottonwood Populus heterophylla, bays Magnolia spp., titi Cliftonia monophylla, buttonbush Cephalanthus occidentalis, greenbrier Smilax spp., sedges Cyperaceae, and fetter bush Lyonia spp.

## B. Basins

Basins are depressed areas that lack natural outlets and are flooded during wet seasons by surface water from the surrounding area. The vegetation is chiefly cypress Taxodium distichum, blackgum Nyssa sylvatica, red maple Acer rubrum, pine Pinus spp., titi Cliftonia monophylla, sweetbay Magnolia virginiana, redbay Persea borbonia, greenbrier Smilax spp., sedges Cyperaceae, fetter bush Lyonia spp., and buttonbush Cephalanthus occidentalis.

## C. Flats

This land type is made up largely of poorly drained flats that have small depressions within the area. During periods of heavy rainfall, the water table is just below the surface in the flats and just above the surface in the depressions. These flooded depressions make up eight percent of this land type.

The vegetation on the flat areas is pine Pinus spp., blackgum Nyssa sylvatica, sweetgum Liquidambar styraciflua, water oak Quercus nigra, live oak Quercus virginiana, swamp chestnut oak Quercus michauxii, gallberry Ilex glabra, wiregrass Aristida stricta, saw palmetto Serenoa repens, and wax myrtle Myrica cerifera.

In the depressions, the vegetation is chiefly cypress Taxodium distichum, blackgum Nyssa sylvatica, pine Pinus spp., and oak Quercus spp.

WILDLIFE WETLANDS DISTRIBUTION BY TYPE  
(in acres)

County	Salt Marsh	Fresh Marsh	Tidal Swamp	Perennial Stream Flood Plains	Intermittent Stream Flood Plains	Inland Basins	Inland Flats	Total 1/ Wildlife Wetland
Bryan	7.3 2/ 20,495	.7 2,020	1.3 3,685	6.0 14,815	15.0 41,465	10.0 27,765	10.0 27,050	40.0 112,405
Camden	19.0 78,275	5.1 21,000	5.1 21,000	2.6 10,950	5.5 22,760	2.7 11,265	26.0 108,225	42.0 173,905
Glynn	28.6 74,235	1.8 4,700	1.8 4,700	1.5 3,740	10.0 26,195	4.1 10,555	26.3 68,480	50.0 129,605
Liberty	12.4 39,760	.4 1,500	.4 1,500	3.0 9,720	16.0 52,020	5.2 16,740	17.0 55,420	38.8 125,170
Long	0	0	0	12.3 31,655	18.5 47,570	2.0 5,500	21.0 53,895	34.7 89,040
McIntosh	29.3 77,485	2.1 5,650	5.3 14,030	3.2 8,505	11.8 31,320	3.7 9,660	16.7 44,435	56.8 150,200
Project	16.2 290,250	1.9 34,870	2.5 44,415	4.4 79,385	12.3 221,330	4.5 81,485	20.0 357,505	43.4 780,325

1/ Figure is sum of salt marsh, fresh marsh, tidal swamp, perennial stream flood plains, intermittent stream flood plains, inland basins, and 8.0 percent of inland flats.

2/ Percent of county or project land area.

Appendix Table 10

## COMMERCIAL FOREST LAND BY OWNERSHIPS IN PROJECT AREA

<u>Type</u>	<u>Approximate Acreage</u>	<u>Percent</u>
Miscellaneous Federal	230,700	16.1
State	14,400	1.5
Forest Industry	556,000	39.0
Farmer	98,100	6.9
Corporate	58,400	4.1
Individual	462,700	32.4

Source: Forest Statistics 1971, U.S. Forest Service, USDA

Appendix Table 11

## PROJECT TOTAL GROWING STOCK (cords)

<u>Species</u>	<u>Total Volume</u>	<u>Annual Growth</u>	<u>Annual Cut</u>	<u>Growth in Excess of Cut</u>
Pine	11,046,575	863,013	797,260	65,753
Other Softwood	1,264,383	30,136	6,849	23,287
Soft Hardwoods	5,520,547	136,986	108,219	28,767
Hardwoods	<u>3,991,780</u>	<u>105,479</u>	<u>69,863</u>	<u>35,616</u>
Total	21,823,285	1,135,614	982,191	153,423

Source: Forest Statistics 1971, U.S. Forest Service, USDA



WOODLAND SUITABILITY GROUPS <sup>1/</sup> AND ESTIMATED EXTENT BY COUNTY (acres)

Woodland Suitability Group <sup>2/</sup>	Bryan	Camden	Glenn	Liberty	Long	McIntosh	Project
1w9	2,395	15,940	1,270	9,010	400	205	29,220
2o1	585	---	---	2,500	1,235	---	4,320
2w2	9,910	---	---	12,130	2,160	---	24,200
2w3	36,225	66,480	32,280	34,270	43,710	49,500	262,465
2w8	6,480	7,220	---	2,770	410	8,160	25,040
2w9	84,595	110,390	83,970	64,040	77,240	60,480	480,715
3s2	12,235	7,520	---	14,250	4,220	410	38,635
3w2	50,735	23,760	18,570	64,310	48,650	12,385	218,410
4s2	12,570	4,510	4,220	11,260	11,620	15,360	59,540
4w2	6,110	28,280	12,240	26,510	17,360	30,960	121,460
4w3	1,275	31,280	5,070	2,000	8,500	---	48,125
5s3	<u>5,435</u>	<u>1,810</u>	<u>---</u>	<u>---</u>	<u>21,030</u>	<u>1,955</u>	<u>30,230</u>
Total Woodland	228,550	297,190	157,620	243,050	236,535	179,415	1,342,360

<sup>1/</sup> See Appendix for woodland suitability group description, productivity, and suitable planting species.

<sup>2/</sup> See Table 6 for woodland suitability group of specific soil series.

Appendix Table 13

## SOIL GROUPINGS ACCORDING TO WOODLAND SUITABILITY

Woodland Suitability Group (Symbol and Description)	Suitable Trees	Site Class <sup>1/</sup>	Wildlife Benefitted	
			For Food <sup>2/</sup>	For Cover <sup>2/</sup>
1w9 Excessively wet soils with very high potential productivity; severe equipment restrictions and seedling mortality on areas without adequate surface drainage. Suitable for needleleaf and/or broadleaf trees.	Loblolly Pine	100	B, S	B, D, M, Q, R, S
	Slash Pine	100	B, S	B, D, M, Q, R, S
	Sweet Gum	100	B, D, S	B, Q, S, W
	Sycamore	90	B, D	B, D, S
	Water Oaks	90	B, D, Q, S, T, W	B, D, M, Q, S, T, W
	Water Tupelo	--	B, D, T, W	D, W
2c1 Soils with high potential productivity; no serious management problems; best suited for needleleaf trees.	Loblolly Pine	90	B, S	B, D, M, Q, R, S
	Slash Pine	90	B, S	B, D, M, Q, R, S
2w2 Seasonally wet soils with high productivity; moderate equipment restrictions and slight to moderate seedling mortality; best suited for needleleaf trees.	Cottonwood	110	B, D	B, D, S, W
	Yellow Poplar	110	B, D	B, M, S
	Sweet Gum	100	B, D, S	B, Q, S, W
	Loblolly Pine	90	B, S	B, D, M, Q, R, S
	Slash Pine	90	B, S	B, D, M, Q, R, S
	Sycamore	90	B, D	B, D, S
	Water Oaks	90	B, D, Q, S, T, W	B, D, M, Q, S, T, W
	Cherrybark Oak	--	B, D, Q, S, T, W	B, D, S, T, W
2w3 Excessively wet soils with high potential productivity severe equipment limitations and seedling mortality without adequate surface drainage; best suited for needleleaf trees.	Loblolly Pine	90	B, S	B, D, M, Q, R, S
	Slash Pine	90	B, S	B, D, M, Q, R, S
2w8 Seasonally wet soils with high potential productivity moderate equipment restrictions and slight to moderate seedling mortality; suitable for needleleaf trees and/or broadleaf trees.	Yellow Poplar	110	B, D	B, M, S
	Sweet Gum	100	B, D, S	B, Q, S, W
	Loblolly Pine	90	B, S	B, D, M, Q, R, S
	Slash Pine	90	B, S	B, D, M, Q, R, S
	Sycamore	90	B, D	B, D, S
	Water Oaks	90	B, D, Q, S, T, W	B, D, M, Q, S, T, W
	Cherrybark Oak	--	B, D, Q, S, T, W	B, D, S, T, W

<sup>1/</sup> Potential productivity with adequate surface drainage.

<sup>2/</sup> B - song and insectivorous birds; D - deer; M - doves;  
Q - quail; R - rabbit; S - squirrel; T - turkey;  
W - water birds.

<sup>3/</sup> See Table 6 for woodland suitability group of specific soil series.

2w9	Excessively wet soils with high potential productivity severe equipment restrictions and seedling mortality on areas without adequate surface drainage; suitable for broadleaf and/or needleleaf trees.	Yellow Poplar	100	B,D	B,M,S
		Loblolly Pine	90	B,S	B,D,M,Q,R,S
		Slash Pine	90	B,S	B,D,M,Q,R,S
		Sweet Gum	90	B,D,S	B,Q,S,W
		Sycamore	90	B,D	B,D,S
		Cherrybark Oak	--	B,D,Q,S,T,W	B,D,S,T,W
		Water Oaks	--	B,D,Q,S,T,W	B,D,M,Q,S,T,W
3s2	Sandy soils with moderately high productivity; moderate equipment restrictions and seedling mortality; best suited for needleleaf trees.	Loblolly Pine	80	B,S	B,D,M,Q,R,S
		Slash Pine	80	B,S	B,D,M,Q,R,S
		Longleaf Pine	70	B,S	B,D,M,Q,R,S
3w2	Seasonally wet soils with moderately high potential productivity; moderate equipment restrictions and slight to moderate seedling mortality; best suited for needleleaf trees.	Loblolly Pine	80	B,S	B,D,M,Q,R,S
		Slash Pine	80	B,S	B,D,M,Q,R,S
4s2	Sandy soils with moderate productivity; moderate equipment restrictions and seedling mortality; best suited for needleleaf trees.	Loblolly Pine	70	B,S	B,D,M,Q,R,S
		Slash Pine	70	B,S	B,D,M,Q,R,S
		Longleaf Pine	60	B,S	B,D,M,Q,R,S
4w2	Seasonally wet soils with moderate productivity; moderate seedling mortality and equipment restrictions; best suited for needleleaf trees.	Loblolly Pine	70	B,S	B,D,M,Q,R,S
		Slash Pine	70	B,S	B,D,M,Q,R,S
		Longleaf Pine	60	B,S	B,D,M,Q,R,S
4w3	Excessively wet soils with moderate productivity severe equipment restrictions and seedling mortality; suitable for needleleaf trees.	Loblolly Pine	70	B,S	B,D,M,Q,R,S
		Slash Pine	70	B,S	B,D,M,Q,R,S
5s3	Sandy soils with low productivity; severe seedling mortality and moderate equipment restrictions; best suited for needleleaf trees.	Slash Pine	60	B,S	B,D,M,Q,R,S
		Longleaf Pine	50	B,S	B,D,M,Q,R,S
		Sand Pine	--	B,S	B,D,M,Q,R,S

1/ Potential productivity with adequate surface drainage.

2/ B - song and insectivorous birds; D - deer; M - doves;  
Q - quail; R - rabbit; S - squirrel; T - turkey;  
W - water birds.

3/ See Table 6 for woodland suitability group of specific soil series.

Appendix Table 14

## PUBLIC RECREATION MANAGEMENT AREAS--EXISTING AND NEEDED

<u>Type of Area</u>	<u>Existing</u>		<u>Additions Needed</u>	
	<u>Number</u>	<u>Acres</u>	<u>Number</u>	<u>Acres</u>
<u>Local Facilities:</u>				
Neighborhood parks	7	54	10	15
Playfields	10	60	11	35
Local parks	12	432	6	150
Regional parks	0	0	2	500
Golf courses	5	650	4	400
Natural areas	1	16	4	1,500
Other	13	13	--	--
<u>State Facilities:</u>				
Parks:				
Multiple use	10	3,090	2	70
Natural	1	191	5	50
Historic	1	15	3	30
Wildlife areas	4	14,934	--	--
Historic & archaeological	2	43	--	--
Designated sites	118	--	--	--
<u>Federal Facilities:</u>				
Parks:				
Natural	0	0	1	23,800
Historic	1	209	--	--
Refuges	2	7,780	--	--
Wilderness	0	0	8	500
<u>Private Facilities:</u>				
Golf courses	3	350		
Natural areas	29	118,548		
General recreation	25	1,116		

Appendix Table 15

APPRAISAL OF POTENTIAL FOR OUTDOOR RECREATION DEVELOPMENTS<sup>1/</sup>

<u>Kind of Development</u>	<u>County</u>					
	<u>Bryan</u>	<u>Camden</u>	<u>Glynn</u>	<u>Liberty</u>	<u>Long</u>	<u>McIntosh</u>
Vacation Cabins, Cottages, Homesites	M	M	M	M	M	M
Camping						
Vacation Site	M	M	M	M	M	M
Pack Trip	M	M	M	H	M	M
Transient	M	M	M	L	L	M
Picnic & Field Sports Areas						
Game, Play, Target Areas	M	M	M	L	L	M
Bicycling	M	M	M	L	L	M
Picnicking	M	M	M	L	L	M
Fishing Waters						
Warm Water	H	H	H	M	M	H
Golf Courses						
Standard	M	M	M	L	L	M
Miniature	M	L	M	L	L	M
Hunting Areas						
Small Game	M	M	M	M	M	M
Big Game	H	H	H	H	H	H
Waterfowl	M	H	H	M	M	H
Natural, Scenic & Historic Areas						
Natural	H	H	H	H	M	H
Scenic	M	H	M	M	M	H
Historic	H	M	M	H	M	M
Riding Stables	M	M	M	L	L	M
Shooting Preserves	M	M	M	L	L	M
Vacation Farms	M	L	M	M	M	M
Water Sports Areas	M	M	M	M	M	M

H = High Potential  
M = Medium Potential  
L = Low Potential

<sup>1/</sup> Based on appraisal of entire county and not on specific sites.

**COASTAL ZONE  
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